The following species of the genera Deraeocoris Kirschbaum and Deraeocapsus Knight are known to occur in Oregon: Deraeocoris bakeri Knight, D. brevis (Uhler), D. validus (Reuter), D. incertus Knight, D. rufusculus Knight, D. piceicola Knight, D. fasciolus Knight, D. shastan Knight, D. schwarzii (Uhler), D. fulgidus (Van Duzee), D. rubroclarius Knight, D. cerachates Uhler, D. fenestratus (Van Duzee), D. fusifrons Knight, Deraeocapsus ingens (Van Duzee) and Deraeocapsus fraternus (Van Duzee). Three unknown species named a, b, and c have also been found.

A description of the external morphology is given for each species. Parts of the genital structures, with special emphasis on the genital claspers, the vesica or endosoma, the sclerotized rings and the posterior wall of the bursa copulatrix, were also described for each species. These structures were found to show variation between species, and thus, to provide useful taxonomic characters for the species of these two genera and probably for the subfamily Deraeocorinae.

On the basis of the overall similarities of the genital structures, the species of Deraeocoris of Oregon can be divided in two groups. The genus Deraeocapsus although closely related to Deraeocoris,
is distinct in the structures of the posterior wall of the bursa copulatrix and the sclerotized rings and appears to represent a valid genus.
The *Deraeocoris* Kirschbaum and *Deraecapsus* Knight of Oregon (Hemiptera:Miridae)

by

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>LITERATURE REVIEW</td>
<td>4</td>
</tr>
<tr>
<td>MATERIALS AND METHODS</td>
<td>9</td>
</tr>
<tr>
<td>TAXONOMIC CHARACTERS</td>
<td>13</td>
</tr>
<tr>
<td>MORPHOLOGY OF THE MALE GENITALIA</td>
<td>15</td>
</tr>
<tr>
<td>MORPHOLOGY OF THE FEMALE GENITALIA</td>
<td>18</td>
</tr>
<tr>
<td>BIOLOGY</td>
<td>21</td>
</tr>
<tr>
<td>GENUS DERAEOCORIS KIRSCHAUM</td>
<td>24</td>
</tr>
<tr>
<td>Key to the Species of Deraeocoris of Oregon</td>
<td>26</td>
</tr>
<tr>
<td>Deraeocoris bakeri Knight</td>
<td>30</td>
</tr>
<tr>
<td>Deraeocoris brevis (Uhler)</td>
<td>33</td>
</tr>
<tr>
<td>Deraeocoris validus (Reuter)</td>
<td>41</td>
</tr>
<tr>
<td>Deraeocoris incertus Knight</td>
<td>45</td>
</tr>
<tr>
<td>Deraeocoris rufusculus Knight</td>
<td>48</td>
</tr>
<tr>
<td>Deraeocoris piceicola Knight</td>
<td>50</td>
</tr>
<tr>
<td>Deraeocoris fasciolus Knight</td>
<td>53</td>
</tr>
<tr>
<td>Deraeocoris shastan Knight</td>
<td>57</td>
</tr>
<tr>
<td>Deraeocoris schwarzii (Uhler)</td>
<td>59</td>
</tr>
<tr>
<td>Deraeocoris fulgidus (Van Duzee)</td>
<td>62</td>
</tr>
<tr>
<td>Deraeocoris rubroclarus Knight</td>
<td>66</td>
</tr>
<tr>
<td>Deraeocoris Species a</td>
<td>68</td>
</tr>
<tr>
<td>Deraeocoris Species b</td>
<td>70</td>
</tr>
<tr>
<td>Deraeocoris Species c</td>
<td>72</td>
</tr>
<tr>
<td>Deraeocoris cerachates Uhler</td>
<td>74</td>
</tr>
<tr>
<td>Deraeocoris fenestratus (Van Duzee)</td>
<td>77</td>
</tr>
<tr>
<td>Deraeocoris fusifrons Knight</td>
<td>80</td>
</tr>
<tr>
<td>GENUS DERAEOCAPSUS KNIGHT</td>
<td>83</td>
</tr>
<tr>
<td>Key to the Species of Deraeocapsus</td>
<td>84</td>
</tr>
<tr>
<td>Deraeocapsus ingens (Van Duzee)</td>
<td>84</td>
</tr>
<tr>
<td>Deraeocapsus fraternus (Van Duzee)</td>
<td>87</td>
</tr>
<tr>
<td>CONCLUSIONS</td>
<td>90</td>
</tr>
<tr>
<td>SUMMARY</td>
<td>92</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>95</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS (Continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPENDIX</td>
<td>101</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1.</td>
<td><em>Deraeocoris fulgidus</em> (Van Duzee). Ventral view of male abdomen.</td>
</tr>
<tr>
<td>2.</td>
<td><em>D. fulgidus</em> (Van Duzee). Lateral view of male abdomen.</td>
</tr>
<tr>
<td>3.</td>
<td><em>D. fulgidus</em> (Van Duzee). Dorsal view of genocoxite with top removed.</td>
</tr>
<tr>
<td>4.</td>
<td><em>D. fulgidus</em> (Van Duzee). Lateral view of phallotheca.</td>
</tr>
<tr>
<td>5.</td>
<td><em>D. fulgidus</em> (Van Duzee). Dorsal view of base phallotheca.</td>
</tr>
<tr>
<td>6.</td>
<td><em>D. fulgidus</em> (Van Duzee). Ventral view of vesica.</td>
</tr>
<tr>
<td>7.</td>
<td><em>D. fulgidus</em> (Van Duzee). Left clasper.</td>
</tr>
<tr>
<td>8.</td>
<td><em>D. fulgidus</em> (Van Duzee). Right clasper.</td>
</tr>
<tr>
<td>10.</td>
<td><em>D. fulgidus</em> (Van Duzee). Dorsal view of female genitalia.</td>
</tr>
<tr>
<td>11.</td>
<td><em>D. fulgidus</em> (Van Duzee). Ventral view of female abdomen.</td>
</tr>
<tr>
<td>12.</td>
<td><em>D. fulgidus</em> (Van Duzee). First valvulae.</td>
</tr>
<tr>
<td>13.</td>
<td><em>D. fulgidus</em> (Van Duzee). Second valvulae.</td>
</tr>
<tr>
<td>14.</td>
<td><em>Deraeocoris bakeri</em> Knight. Parameres.</td>
</tr>
<tr>
<td>15.</td>
<td><em>D. brevis</em> (Uhler). Parameres.</td>
</tr>
<tr>
<td>17.</td>
<td><em>D. incertus</em> Knight. Parameres.</td>
</tr>
<tr>
<td>17'.</td>
<td><em>D. rufusculus</em> Knight. Parameres.</td>
</tr>
<tr>
<td>18.</td>
<td><em>D. piceicola</em> Knight. Parameres.</td>
</tr>
<tr>
<td>19.</td>
<td><em>D. fasciolus</em> Knight. Parameres.</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>20.</td>
<td>D. schwartzii (Uhler). Parameres.</td>
</tr>
<tr>
<td>21.</td>
<td>D. cerachates Uhler. Parameres</td>
</tr>
<tr>
<td>22.</td>
<td>D. fenestratus (Van Duzee). Parameres.</td>
</tr>
<tr>
<td>23.</td>
<td>D. fusifrons Knight. Parameres.</td>
</tr>
<tr>
<td>24.</td>
<td>Deraeocapsus ingens (Van Duzee). Parameres.</td>
</tr>
<tr>
<td>25.</td>
<td>Deraeocoris bakeri Knight. Lateral view of phallotheca.</td>
</tr>
<tr>
<td>27.</td>
<td>D. incertus Knight. Lateral view of phallotheca.</td>
</tr>
<tr>
<td>29.</td>
<td>D. piceicola Knight. Lateral view of phallotheca.</td>
</tr>
<tr>
<td>30.</td>
<td>D. fasciolus Knight. Lateral view of phallotheca.</td>
</tr>
<tr>
<td>32.</td>
<td>Deraeocapsus ingens (Van Duzee). Lateral view of phallotheca.</td>
</tr>
<tr>
<td>33.</td>
<td>Deraeocoris cerachates (Uhler). Lateral view of phallotheca.</td>
</tr>
<tr>
<td>34.</td>
<td>D. fenestratus (Van Duzee). Lateral view of phallotheca.</td>
</tr>
<tr>
<td>35.</td>
<td>D. bakeri Knight. Ventral view of vesica.</td>
</tr>
<tr>
<td>36.</td>
<td>D. brevis (Uhler). Ventral view of vesica.</td>
</tr>
<tr>
<td>37.</td>
<td>D. validus (Reuter). Ventral view of vesica.</td>
</tr>
<tr>
<td>38.</td>
<td>D. incertus Knight. Ventral view of vesica.</td>
</tr>
<tr>
<td>39.</td>
<td>D. piceicola Knight. Ventral view of vesica.</td>
</tr>
<tr>
<td>40.</td>
<td>D. fasciolus Knight. Ventral view of vesica.</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>41.</td>
<td><em>D. schwarzi</em> (Uhler). Ventral view of vesica.</td>
</tr>
<tr>
<td>42.</td>
<td><em>D. rubroclarus</em> Knight. Ventral view of vesica.</td>
</tr>
<tr>
<td>43.</td>
<td><em>D. cerachates</em> Uhler. Ventral view of vesica.</td>
</tr>
<tr>
<td>44.</td>
<td><em>D. fenestratus</em> (Van Duzee). Ventral view of vesica.</td>
</tr>
<tr>
<td>45.</td>
<td><em>D. fusifrons</em> Knight. Ventral view of vesica.</td>
</tr>
<tr>
<td>46.</td>
<td><em>Deraeocapsus fraternus</em> (Van Duzee). Ventral view of vesica.</td>
</tr>
<tr>
<td>47.</td>
<td><em>Deraeocapsus ingens</em> (Van Duzee). Ventral view of vesica.</td>
</tr>
<tr>
<td>49.</td>
<td><em>D. brevis</em> (Uhler). Posterior wall.</td>
</tr>
<tr>
<td>50.</td>
<td><em>D. validus</em> (Reuter). Posterior wall.</td>
</tr>
<tr>
<td>51.</td>
<td><em>D. incertus</em> Knight. Posterior wall.</td>
</tr>
<tr>
<td>52.</td>
<td><em>D. rufusculus</em> Knight. Posterior wall.</td>
</tr>
<tr>
<td>53.</td>
<td><em>D. piceicola</em> Knight. Posterior wall.</td>
</tr>
<tr>
<td>54.</td>
<td><em>D. fasciolus</em> Knight. Posterior wall.</td>
</tr>
<tr>
<td>55.</td>
<td><em>D. schwarzi</em> (Uhler). Posterior wall.</td>
</tr>
<tr>
<td>56.</td>
<td><em>D. fulgidus</em> (Van Duzee). Posterior wall.</td>
</tr>
<tr>
<td>57.</td>
<td><em>D. rubroclarus</em> Knight. Posterior wall.</td>
</tr>
<tr>
<td>58.</td>
<td><em>D. cerachates</em> Uhler. Posterior wall.</td>
</tr>
<tr>
<td>59.</td>
<td><em>Deraeocorix fenestratus</em> (Van Duzee). Posterior wall.</td>
</tr>
<tr>
<td>60.</td>
<td><em>D. fusifrons</em> Knight. Posterior wall.</td>
</tr>
<tr>
<td>61.</td>
<td><em>D. fusifrons</em> Knight. Posterior wall.</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>62.</td>
<td><strong>Deraeocapsus fraternus</strong> (Van Duzee). Posterior wall.</td>
</tr>
<tr>
<td>63.</td>
<td><strong>Deraeocapsus ingens</strong> (Van Duzee). Posterior wall.</td>
</tr>
<tr>
<td>64.</td>
<td><strong>Deraeocoris bakeri</strong> Knight. Sclerotized rings.</td>
</tr>
<tr>
<td>65.</td>
<td><strong>D. brevis</strong> (Uhler). Sclerotized rings.</td>
</tr>
<tr>
<td>66.</td>
<td><strong>D. validus</strong> (Reuter). Sclerotized rings.</td>
</tr>
<tr>
<td>67.</td>
<td><strong>D. incertus</strong> Knight. Sclerotized rings.</td>
</tr>
<tr>
<td>68.</td>
<td><strong>Deraeocoris rufusculus</strong> Knight. Sclerotized rings.</td>
</tr>
<tr>
<td>69.</td>
<td><strong>D. fasciolus</strong> Knight. Sclerotized rings.</td>
</tr>
<tr>
<td>70.</td>
<td><strong>D. piceicola</strong> Knight. Sclerotized rings.</td>
</tr>
<tr>
<td>71.</td>
<td><strong>D. schwarzi</strong> (Uhler). Sclerotized rings.</td>
</tr>
<tr>
<td>72.</td>
<td><strong>D. fulgidus</strong> (Van Duzee). Sclerotized rings.</td>
</tr>
<tr>
<td>73.</td>
<td><strong>D. rubroclarus</strong> Knight. Sclerotized rings.</td>
</tr>
<tr>
<td>74.</td>
<td><strong>D. cerachates</strong> Uhler. Sclerotized rings.</td>
</tr>
<tr>
<td>75.</td>
<td><strong>D. fenestratus</strong> (Van Duzee). Sclerotized rings.</td>
</tr>
<tr>
<td>76.</td>
<td><strong>D. fusifrons</strong> Knight. Sclerotized rings.</td>
</tr>
<tr>
<td>77.</td>
<td><strong>D. fusifrons</strong>. Sclerotized rings.</td>
</tr>
<tr>
<td>78.</td>
<td><strong>Deraeocapsus fraternus</strong> Van Duzee. Sclerotized rings.</td>
</tr>
<tr>
<td>79.</td>
<td><strong>D. ingens</strong> Van Duzee. Sclerotized rings.</td>
</tr>
<tr>
<td>80.</td>
<td><strong>Deraeocoris</strong> species a. Parameres.</td>
</tr>
<tr>
<td>81.</td>
<td><strong>Deraeocoris</strong> species a. Ventral view of vesica.</td>
</tr>
<tr>
<td>82.</td>
<td><strong>Deraeocoris</strong> species b. Parameres.</td>
</tr>
<tr>
<td>83.</td>
<td><strong>Deraeocoris</strong> species b. Ventral view of vesica.</td>
</tr>
<tr>
<td>84.</td>
<td><strong>Deraeocoris</strong> species c. Parameres.</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>85.</td>
<td><em>Deraeocoris</em> species c. Ventral</td>
</tr>
<tr>
<td>86.</td>
<td><em>Deraeocoris</em> species c. Sclerotized rings.</td>
</tr>
<tr>
<td>87.</td>
<td><em>Deraeocoris</em> species c. Posterior wall of bursa copulatrix.</td>
</tr>
</tbody>
</table>
INTRODUCTION

Within the large family Miridae, the Deraeocorinae are represented by five tribes, the Termatophylini, Clivenimini, Saturinomirini, Hyalodini and Deraeocorini. The tribe Deraeocorini Douglas and Scott, 1865 includes approximately 250 species contained within 25 genera and distributed throughout the major faunal provinces of the world. In North America, this tribe has five genera, containing approximately 90 species (Carvalho, 1957). Two species of the genus Deraeocapsus, 13 of Deraeocoris and 1 species of Eurychilopterella have been recorded from Oregon. It is believed, however, that the actual number of the species in Oregon is higher than the figure shown above, because some species recorded from neighboring states are likely to occur in Oregon, for instance Deraeocoris histrio (Reuter) and D. borealis Knight, and because the entire state has not been thoroughly collected.

The writer is interested in this group because many, if not all, of its members are known predators. A few species such as Deraeocoris brevis (Uhler) and D. fasciolus Knight are of importance in the control of aphids and psyllids, pests of orchards. In southern Oregon, D. brevis (Uhler) has been reported as an important predator of the pear psylla, Psylla pyricola Foester. In spite of their predacious feeding habits, many species of Deraeocoris have been seen to feed occasionally on leaves. In captivity, many species survived two to three weeks fed on plant material alone.

This investigation was undertaken in an attempt to study the
species of the tribe known to occur in Oregon and to provide information on their biology, distribution, host plants and prey whenever possible. A study of the features of the male and female genitalia was made in addition of the description of external morphology. The features studied in the male genitalia were the claspers, the phallotheca and the vesica. Only two features of the female have been investigated, the sclerotized rings and the posterior wall of the bursa copulatrix. The female genitalia, especially the posterior wall of the bursa copulatrix appeared to provide useful specific characters and a stable structure within a species.

Except for D. brevis (Uhler), and a few other species, very little is known of the biology and life history of the Oregon species, due to their relative scarcity. Many species are restricted to one or a very few host-plants. Moreover, they are often found in a very localized part of their host plants range. The knowledge of the plants from which the species have been collected is useful for a preliminary determination of the species, even though they themselves are predacious.

The following species were examined: Deraeocoris bakeri Knight, D. brevis (Uhler), D. validus (Reuter), D. incertus Knight, D. rufuscusculus Knight, D. piceicola Knight, D. fasciolus Knight, D. shastan Knight, D. schwarzii (Uhler), D. fulgidus (Van Duzee), D. cerachates Uhler, D. fenestratus Van Duzee, D. fusifrons Knight, D. rubroclarus Knight, Deraeocapsus ingens (Van Duzee) and Deraeocapsus fraternus (Van Duzee). An unknown species of Deraeocoris from Corvallis also has been examined. It shows close relationship with D. fenestratus (Van Duzee) and D. fusifrons Knight. D. brevis var. piceatus Knight is considered here to be only a color variation of D. brevis Uhler.
Finally, three undescribed species of *Deraeocoris* have also been considered.

It is hoped that this preliminary study of the tribe *Deraeocorini* of Oregon will stimulate further studies of the intimate biology and ecology of this tribe.
LITERATURE REVIEW

The history of the tribe Deraeocorini, sensu Carvalho (1955 and 1957), began in 1865 when Douglas and Scott founded the family Deraeocoridae. It is noted here that all the 14 species they included in this family are now placed in the subfamily Mirinae and not Deraeocorinae. Knight (1921) mentioned this fact in his monograph of the genus *Deraeocoris* of North America. Reuter (1910), ignored the family Deraeocoridae Douglas and Scott and classified the genera *Deraeocoris* and *Camptobrochis* in the division Capsaria, subfamily Mirina and family Miridae. Van Duzee (1916) made the first key to the North American genera of Miridae. He used Reuter's grouping of the subfamilies but he rearranged the tribes and divisions. Van Duzee included six genera including both *Camptobrochis* Fieber and *Deraeocoris* Kirschbaum in the division Deraeocoraria of the tribe Capsini. He credited the authorship of his Deraeocoraria to Douglas and Scott although the genera and species he based his division on were different from those of the Douglas and Scott's Deraeocoridae. Knight (1918) presented a new key to the subfamilies of Miridae and raised the division Deraeocoraria of Van Duzee to subfamily status. In Carvalho's key (1955) to the world genera of Miridae, the Deraeocorini are grouped with the Termatophylini, Clivenimini Hyalodini and Saturniomirini to form the subfamily Deraeocorinae. This is the most widely used classification now, with very few modifications. Schuh (1976) combined the Deraeocorinae and the Mirinae to form the subfamily Mirinae *sensu latu*.

The phylogenetic position of the Deraeocorinae has been examined by several authors. Based on the structure of the pretarsus and the
external morphology, Reuter (1905) created a phylogenetic tree where the Capsaria, including the Deraeocorinae, and the Miraria have a common stem. Knight (1949) placed the Deraeocorinae between the Cylapinae and the Mirinae but his genealogical tree suggests that the Deraeocorinae are more closely related to the Cylapinae than to the Mirinae. In his study of the female genitalia of the Miridae, Slater (1950) noted that the posterior wall of the bursa copulatrix of the Deraeocorinae may have been derived from that of the Mirinae and Capsinae by simplification since the sclerotized rings found in the Deraeocorinae are more advanced than the Mirinae. Kelton's conclusion (1959), based on the male genitalia, is somewhat different: the vesica of the Deraeocorinae and Mirinae offers many similarities but the gonopore of the Deraeocorinae is more primitive; he thought that the Mirinae may have been derived from the Deraeocorinae. According to Schuh (1974), the Mirinae and Deraeocorinae have many characters in common and the pretarsal structure of the Deraeocorinae may have developed by secondary simplification from that of the Mirinae; in light of this evidence, he derived the Mirinae and the Deraeocorinae from a common stem. The same author (1976), on the basis of a cladistic analysis of the pretarsal structure, proposed the fusion of the two groups into a single subfamily, the Mirinae. The Deraeocorinae and the Mirinae are considered by Schuh (1974, 1976), the most advanced groups in the Miridae. The phylogeny within the Deraeocorinae has not yet been studied by anyone. The writer believes that a cladistic analysis of the genital structure of both sexes offers a potentially useful basis for such an investigation.

Most of the work done on the genus Deraeocoris has been of a
The genus was founded by Kirschbaum in 1855, but was not fully recognized until Distant (1902) fixed Cimex olivaceus Fabricius as the type species. The American species of the genus were placed in the genus Camptobrochis Fieber. Poppius (1912) placed Camptobrochis as a synonym of Deraeocoris Kirschbaum. The name Camptobrochis is now used as a subgeneric name for some of the species of Deraeocoris having a punctate scutellum. The North American species of the genus Deraeocoris have been described by Uhler (1872, 1887, 1894, 1904), Van Duzee (1914, 1916, 1917, 1920), Reuter (1876, 1907), Knight (1921, 1927), Bliven (1956) and Akingbohungbe (1972). The most authoritative work in this genus is Knight's monograph (1921), where he described the species then known to occur in North America and arranged them into groups of species. In the same monograph, he transferred Deraeocoris ingens and D. fraternus Van Duzee to a newly described genus, Deraeocapsus, because of the differences found in the second antennal segment. The genera Deraeocoris and Deraeocapsus received little attention from taxonomists after 1921.

Slater (1950), investigating the female genitalia of the Miridae, included five species of Deraeocoris in his study. Six species of Deraeocoris, one species of Deraeocapsus and one species of Eurychilop-terella Reuter were studied by Kelton (1959) in his works on the male genitalia of the Miridae. The following works are some of the most important in understanding the genitalia structures of the Heteroptera in general and of the Miridae: Singh-Pruthi (1925), Knight (1923), Snodgrass (1933), Dupuis (1955, 1956) and Scudder (1959), Wagner and Weber (1964). The writer has not been able to examine the papers of Kullenberg (1941 and 1947).
The nymphs of the American species of Deraeocoris and Deraeocapsus are poorly known. Knight (1921) described the fifth instar nymphs of a few species, taken with the adults. Recently, Wheeler and Henry (1975) made a detailed study of the nymphal stages of D. nebulosus Uhler. The existing keys based on the nymphs, concern only the higher categories (Akingbohungbe, 1974). Nymphs of some European species of the genus Deraeocoris have been studied by various authors, including Kullenberg (1946) and Southwood and Scudder (1956).

The eggs of terrestrial Heteroptera have been described by Southwood (1956). Cobben (1968) studied the eggs of some European Miridae, including species of Deraeocoris. Sanford (1964) described the eggs and oviposition sites of a few predacious mirids, including D. fasciolus Knight. The structure and function of the egg shell of Deraeocoris ruber (Linneaus), an European species found in the Northeastern United States, were studied by Hartley (1965). In his study of the biology of D. brevis Uhler, Westigard (1973), mentioned that the eggs of this species were inserted in pear leaf petioles.

Biological studies of the species of Deraeocoris and Deraeocapsus are not common. They are limited to a very few species found on orchard trees, noted by D. brevis Uhler, D. fasciolus Knight and D. nebulosus Uhler. In his observations on D. brevis (Uhler), Knowlton (1935, 1946) reported that it was unable to prey upon Eutettix tenelus Baker but it was feeding on nymphs of Eurythroneura ziczac Walsh, Prociphalus fraxinisfolia Riley and Eriosorna americana Riley. Gilliat (1937) found D. fasciolus Knight preying on the larvae of the leaf-roller, Eulia mariana Fern. Those tree species of Deraeocoris have been reported as some of the most important predators in Nova Scotia.
orchards by MacPhee and Sanford (1954, 1957) and in British Columbia orchards by McMullen and Jong (1967). In southern Oregon pear orchards, the importance of *D. brevis* Uhler as a predator of the pear psylla has been studied by Westigard (1973).

The prey and the host plant relationship of the majority of the North American species of *Deraeocoris* and *Deraeocapsus* remain to be discovered. Knight (1927) has listed the host plants on which six species of *Deraeocoris* were found breeding.
MATERIALS AND METHODS

Approximately 1260 specimens of Deraeocoris and Deraeocapsus have been examined during this study. Most of the materials came from the Oregon State University Entomology Museum. Four hundred and sixty-two specimens were obtained on loan from the California Academy of Sciences, San Francisco. Species such as Deraeocoris brevis (Uhler) were represented by hundreds of specimens whereas most of the other species were known from only a very small number. Many places in Oregon were visited by the writer during the summers of 1976 and 1977 in order to obtain additional specimens. Only very few specimens were collected during these trips, perhaps attributed to the very discrete or localized distribution of most species of the two genera, despite the fact that the collection efforts were concentrated on known host-plants and localities of the species.

The specimens were identified according to Knight's monograph of the genus Deraeocoris (1921). Original descriptions were used as well for the species identification. Dr. J.D. Lattin confirmed the identification of many species by comparing them to the type specimens contained in the United States National Museum, Washington, D.C. Other type specimens were kindly sent by Dr. P.H. Arnaud of the California Academy of Sciences, San Francisco.

Description of the external morphology of each species was made since size and coloration have always been used by many authors as identification criteria of many species. Many Oregon species were found to differ somewhat from the type specimens in size and coloration. The total length of the insect was obtained by measuring the
insect from above from the tip of the tylus to the fracture of the hemelytron and by adding it to lengths of the remaining part of the wings which is usually bent downward in Deraeocoris. The length of the rostrum was obtained by measuring each segment individually. Minimum and maximum measurements were taken when variation in size occurred and adequate number of specimens were available. Descriptions were based on specimens agreeing most closely with the type.

Only dried specimens were used for the study of the genitalia. The specimen was first dipped into hot water for five minutes in order to be removed from the point. This allowed the specimens to be relaxed and avoided unnecessary damage. To remove the abdomen, a little pressure was applied on each side of the attachment of the abdomen to the thorax. Once the abdomen was removed the specimen was remounted on the point. The abdomen was dipped in hot water to enhance the action of potassium hydroxide. After five minutes, it was placed into approximately ten percent potassium hydroxide for a period of five to fifteen minutes depending on the species. Then the abdomen was transferred into a small dissection dish and dissected in potassium hydroxide under the microscope. For the male, the dorsal plate was removed first and by means of two pairs of fine forceps, the phallotheca and the parameres were freed from the genital capsule and placed into distilled water. Usually the vesica will inflate after ten to fifteen minutes. If it did not, the phallotheca and the claspers were placed into a small vial containing a small amount of glycerine for 24 hours. After that period, the vesica was transferred into distilled water and eventually inflation took place. In a few cases, it was necessary to direct the endosoma out of the phallotheca, because the membranous
lobes of the vesica were refrained from inflating by the sclerotized structure of the phallotheca. The female abdomen was treated in the same way as mentioned above. The dorsal plate was removed first. Then the abdomen was replaced in hot potassium hydroxide to get rid of the membranous and fatty materials. When the sclerotized rings were clearly exposed, the abdomen was dipped in a very dilute acetic acid solution to neutralize potassium hydroxide and washed thoroughly in distilled water. The female genitalia were dissected in glycerine. The method used for dissecting the female genitalia was as follows: the abdomen sclerites were removed first. The next step was to free the first rami from the second valvifers. This was done by breaking the ramal plates with a pair of forceps. Then the rami were pulled alternately and forwards with a pair of fine forceps, while with another pair of forceps the valvifers and the second valvulae were held firmly. At the end of this operation, the sclerotized rings, the anterior parts of the bursa copulatrix and the first valvulae were separated from the posterior wall of the bursa copulatrix which remained attached to the second rami and the second valvulae. For illustration purposes, the posterior wall of the bursa copulatrix was removed by inserting a fine and sharp needle along the inner margin of the second rami and the anterior edges of the ovipositor.

After dissection and study, the parts were placed in a microvial containing glycerine and attached to the pin holding the specimen.

The drawings were made with microscope using 15X, 45X and 80X magnifications. The measurements were made by using an eyepiece equipped with a micrometer.

All the specimens dissected are deposited at the Oregon State
University collection and the California Academy of Sciences, San Francisco.
TAXONOMIC CHARACTERS

The species of Deraeocoris and Deraecapsus are very similar in their general appearance. However, they vary greatly in size, coloration, punctation of the dorsum and pubescence. The members of the subfamily Deraeocorinae are distinguished by their hair-like arolia and the absence of pseudoarolia. Their claws are cleft or thickened at the bases and the pronotum are constricted anteriorly (Carvalho, 1955). In Deraeocoris, the claws are more or less toothed at the bases and in Deraeocapsus they are only thickened at the bases. A priori the genus Deraeocapsus can be distinguished by the relatively large size and the strongly clavate second antennal segments.

The taxonomic characters of these two genera have been fully treated by Knight (1921). In addition to his description, only the importance of coloration and the morphology of the male and the female genitalia will be discussed in this section.

Knight created seven groups of species of Deraeocoris. These groups were based on well defined structural differences including characters related to the claws, punctation of the scutellum, presence or absence of hairs or pubescence on the body. Within each group, the species are primarily based on the genital claspers and the coloration patterns. Using color differences is inevitable in a preliminary determination of the species. This, however, requires a knowledge of the range of variation of the color pattern for each species. Coloration is affected by various conditions in the species of Deraeocoris and Deraeocapsus. Each species is color polymorphic. Within the same population, different color forms may be encountered. For example, in
Oregon, the variety *D. b. piceatus* Knight is the common color form of *Deraeocoris brevis* (Uhler). These two forms may be found at various proportions within a same population, and also intergrading color forms from black, *D. brevis* (Uhler), to light brown *D. brevis* variety *piceatus* Knight may be encountered. Besides, the pigmentation may be affected by various climatic factors. In species having several generations a year, especially those of the subgenus *Camptobrochis*, overwintering adults often are different in coloration from the summer generation(s). For the adults, colors vary according to the age; young adults are often lighter in color, for example in *D. fulgidus* Van Duzee, young adults are greyish while the older ones are black. Sexual dimorphism in color may be encountered in many species of *Deraeocoris*, although attenuated and variable. Often the males are more intense in coloration than the corresponding females but the contrary is also true in some species.

During this study, it has not been possible to investigate the intraspecific variation of the genital structure, due to the limited number of specimens available for most of the species studied. In species like *D. brevis* (Uhler) and *D. fulgidus* (Van Duzee), the genital structures have been found to be stable. The general pattern does not change very much, except for some minor variation in the degree of sclerotization, due certainly to age of the specimen. The parts become more sclerotized as the individual matures. Variations in the male vesica were also encountered, due to incomplete inflation.
MORPHOLOGY OF THE MALE GENITALIA

The male abdomen has nine visible segments, segment II to X. The first abdominal segment is much reduced and closely associated with the metathorax. The second through the eight segments have a pair of spiracles near the lateral margins of the ventral surface. The eleventh segment forms the anal tube and is not seen externally. The tenth segment also called proctiger, surrounds the anal opening and is seen dorsally on the anterior margin of the genital opening (Figure 2). The ninth segment is the genital segment, also referred to as a pygophore or genital capsule (Figure 1, G.C.). It does not have a pair of spiracles. It is conical shaped and rounded apically. The pygophore is nearly as long as half of the abdomen. The genital opening is located dorsally at the apical end of the pygophore.

Internally, the pygophore is divided by an intersegmental membrane or diaphragm, which separates the abdominal cavity from the genital chamber. The internal reproductive organs are situated in the body cavity. The genital chamber contains only the euphallic organs, including the phallus, the claspers or parameres, the articulatory processes and the distal portion of the ejaculatory duct. The genital opening opens freely to the exterior.

This study is essentially focused on the euphallic organs of the male and especially on the phallus and the parameres.

The phallus is located within the pygophore, lying on its ventral wall. Only a short portion of the phallus is exposed at rest. The phallus is an enveloping structure, called the phallotheca (Ph, Figures 3 and 4) which is more or less sclerotized depending on the species.
Distally, the phallotheca has a cleavage which allows the endosoma to erect during copulation. The proximal portion of the phallus, or base, consists of a horseshoe-like sclerotized structure. The arms of this structure are called basal plates (Bp, Figures 3, 4, and 5). The basal plates are united transversally by a bridge referred to as "ponticularis transversalis." The basal plates surround the primary gonopore (PGp, Figures 3, 4, and 5) and the basal foramen (BF, Figures 3 and 5). The basal plates are attached to the pygophore by a set of muscles. Dupuis (1956) referred to these muscles as the retractor muscles of the phallus. From the dorsal part of each basal plate arises a structure called "processus capitatius," consisting of a connective part and a rounded plate (PC, Figure 3). The capitate processes attach the phallus to its protractor muscle. The two main structures inside the phallotheca are the ductus seminis and the andosoma or vesica. The ductus seminis (DS, Figure ) has a proximal opening, the primary gonopore. The ejaculatory duct joins the primary gonopore after entering the phallus by the basal foramen. The very proximal part of the ductus seminis is heavily sclerotized in some species. The proximal portion of the ductus seminis appears as a wrinkled tube. It is extensible during the evagination of the endosoma. The ductus seminis curves sharply, even forms a loop in some species, before entering the endosoma. The distal part of the ductus seminis opens into the vesica by the secondary gonopore (SGr, Figure 4). This opening is the actual gonopore of the phallus. The secondary gonopore of the Deraeocorinae is a simple and inconspicuous opening, lacking the sclerotized rim found in other groups of the Miridae. The vesica or endosoma consists of the distal portion of the ductus seminis, the sclerotized plates
surrounding it, the secondary gonopore, the apical membraneous lobes and their sclerotized lobes. The endosoma is contained against the phallotica by a thin membrane, the conjunctiva. The vesica is the part that is evaginated during copulation. At full inflation, the vesica presents taxonomic variations, found in the sclerotized plates surrounding the ductus seminis, the shape and the numbers of the membraneous lobes, and finally in the spicules.

The genital claspers, or parameres, occur on each side of the distal part of the phallus, near the lateral margins of the genital chambers. Four features can be recognized in the parameres of the Deraeocorinae, the base of the parameres or basis parameri (BPs, Figures 2 and 8), the corpus parameri or the shaft, (Clr, Figures 7 and 8), the sensory lobe (S1, Figures 7 and 8) and the apex or hypophyse (Ap, Figures 7 and 8). The base of the paramere serves as muscle attachment to the articulatory process. The left and right claspers are strongly asymmetrical in the Deraeocorini. The right clasper is reduced and more or less elongate. The left clasper is curved and larger in size. The shape and size of the sensory lobe vary depending upon the species. Sensory hairs are generally found on the sensory lobes. The apex may be a simple point or a curved process.
The female abdomen has ten visible segments, segment I to X. The first segment is very reduced and seen dorsally. The tenth segment, as in the male, surrounds the anal opening. The second to the eighth segments have a pair of spiracles on the sublateral surface of the abdomen. The seventh segment is modified and has a mesal, pointed and triangular flap extending from its posterior margin and covering the base of the ovipositor and the vulva. This structure is referred to as the subgenital plate (Sgp, Figure 11). The genital segments consist of the eighth and ninth segments. The genital segments are divided evenly by the sheath of the ovipositor of the second valvifers and the ovipositor. Those portions of the genital segments extending dorsolaterally from the second valvifers to the connexiva (Cnx, Figure 9) are referred to as the paratergites.

The ovipositor consists of two pairs of blades, the first and second valvulae. The second valvulae (2 V1, Figures 10 and 13) are fused on their basal half and are expanded into a bulbous base. The second rami arise from the ventral edge of the base of the second valvulae (2 Ra, Figures 10 and 13). The second rami curve dorsally and are attached to the basal edge of the second valvifers (2 Vlf, Figures 9, 10 and 11). The latter serve as the sheath of the ovipositor. The first valvulae form the lateral blades of the ovipositor. The first valvulae are narrow toward their base, so that in their basal region they cover only the ventral edge of the second valvulae. The first rami arise from the base of the first valvulae and curve dorsally but anteriorly to the second rami. From there they run caudad to join the
ramal plates (RP, Figure 10), which are apodemes formed by the curved anterior margins of the paratergites. The first valvifers consist of a pair of small plates attached to the anterior part of the second valvifers by a branching of the first rami. The third valvulae (3 V1, Figures 9, 10 and 11) are two structures fused to the distal edges of the second valvifers. Both ventral and dorsal edges of the apical region of the first valvulae are armed with small teeth, continuing to the lateral sides. Only the ventral edge of the apex of the second valvulae is toothed.

The bursa copulatrix or genital chamber (Davis, 1955) is attached to the base of the ovipositor by the rami. Its opening is located under the subgenital plate of the seventh segment. Davis (1955) referred to this opening as the "vulva" and used the term "vestibulum" for the narrow passage that leads to the genital chamber. The bursa copulatrix of the Miridae is a narrow passage. The posterior wall of the bursa copulatrix is attached laterally to the second rami and ventrally to the dorsal edge of the base of the ovipositor. It lies in a very oblique plane, with its dorsal margin directed caudad. The posterior wall of the Deraeocorini consists of a simple plate with a pair of sclerotized lobes connected mesally by a narrow bridge. These sclerites are referred to by Slater (1950) as the "A" structure and as the interramal sclerite by Davis (1955). The dorsal and ventral margins are membranous. Often a small sclerotized knob is present on the meson. This structure is probably homologous to the "B" structure of Slater and the sigmoid process of Davis. The posterior wall of the bursa copulatrix varies in size and shape according to the species. Thus, it offers an excellent taxonomic character. The anterior wall of the bursa
copulatrix is attached to the rami. It lies in an almost horizontal plane with its dorsal margin directed forwards. The sclerotized dorsal portion of the anterior wall is referred to by Davis (1955) as the ventral labiate plate. The roof, or the dorsal wall of the genital chamber, also lies between the first rami. Its sclerotized anterior portion or dorsal labiate plate supports the sclerotized rings. These occur in various shapes, structures and size, they may be simple, twisted or strongly looped. They are symmetrical, and are attached to the first rami by the "connecting piece" (Slater, 1950). The sclerotized rings show specific variation and provide good taxonomic character.

The seminal depository (SO, Figure 10) is a membranous sac attached to the dorsal and anterior edges, respectively, of the ventral labiate plate and the dorsal labiate plate. During oviposition, the eggs pass near the opening of the seminal depository or gonopore and are fertilized. The spermatheca is a fine tubular gland that opens into the common oviduct. The latter is found just behind the sclerotized rings.
BIOLOGY

At the present time, information concerning the biology and the life history of most species of *Deraeocoris* and *Deraecapsus* of North America is very sparse and scattered. The known facts in this matter are based mainly on data obtained from collection records.

The majority of the species of these genera overwinter in the egg stage. The species of the subgenus *Camptobrochis* are known to pass the winter in the adult stage. In Oregon, adults of *Deraeocoris brevis* (Uhler) have been taken in January and fifth instar nymphs of *D. validus* (Reuter) in late November. The number of the generations per year seems to vary from one species to another. Those that overwinter as adult are likely to have at least two generations per year. In British Columbia, McMullen and Jong (1967) have reported that *D. brevis* (Uhler) has at least four generations per year. Species that overwinter in the egg stage generally have one or two generations per year. In Oregon, *D. fasciolus* Knight appears to have only one generation, but McMullen and Jong (1967) have reported that it has two generations per year in British Columbia.

Males and females of species of the subgenus *Camptobrochis* overwinter in the adult stage. The eggs are laid in the spring, overwintering females of *D. brevis* and *D. validus* did not contain eggs. Most known species overwinter in the egg stage. These eggs are laid in late fall. The eggs of *Deraeocoris* and *Deraecapsus* are embedded in the plant tissue with a part of the collar exposed. The eggs of species of these genera are very similar in general structure, although they vary greatly in size. The egg is elongate, gently curved and
slightly narrowing towards the operculum. Except the collar, which is elliptical in section, the rest of the egg has a circular cross section. The eggs hatch from mid-May to July. The time required for the nympha development may vary with the species and with factors such as temperature and abundance of prey. *D. brevis* (Uhler) requires an average of 25 days (Westigard, 1973). The author has reared two second instar nymphs of *D. fasciolus* Knight to the adult stage in 17 days. It can be assumed that the development time for this species is also approximately 20-30 days. Wheeler et al. (1976) found an average development time of 29.8 days for *D. nebulosus* (Uhler). The nymphs of *Deraeocoris* are very similar in general appearance. Often, fifth instar nymphs may be recognized on the basis of the claws and characters of the head and antennae. The nymphs of many species are covered with a white powdery substance. Knight (1921) suggests that this substance is mainly found on nymphs of largely predatory species. The nymphs of *D. fulgidus* (Van Duzee) are not covered with a powdery material. The longevity of the adult is not known with certainty. Overwintering adults live much longer than those that pass the winter in the egg stage.

The species of *Deraeocoris* vary in the number of host plants on which they are found. In Oregon, *D. brevis* (Uhler) has been collected from approximately 20 species of plants. This reflects the general predatory habit of this species. It has been reported to feed on various prey species, in the laboratory it has been observed to feed upon anything it could catch flies, lepidopterous larvae, aphids, psyllids, leafhopper nymphs, psocids, etc. The other species have a more limited number of host plants. *D. fulgidus* (Van Duzee) has been collected from *Cercocarpus ledifolius* Nutt., *Arctostaphylos* sp. and *Purshia tridentata*
Pursh. *D. fasciolus* Knight breeds on wild and cultivated filbert (*Corylus* sp.). *D. validus* (Reuter) occurs on *Salix* sp. Certainly those species breeding on a limited number of plant species have a more specialized predatory habit. As mentioned, many if not all species of *Deraeocaris* and *Deraeocapsus* are predators, but many species have been found to feed occasionally on plant materials. The significance of the partial phytophagous habit is still unknown. Whether it provides a special physiological requirement or just provides moisture from the plant remains to be determined. Most species are associated with small arthropodes such as Psocoptera, Psyllidae and Aphidiidae, but the prey preference seems to vary with the species.
GENUS DERAEOCORIS KIRSCHBAUM

Callicapsus Reuter, 1876, Ofv. Svenska Vet.-Ak. Föhr. 32(5):75
Euarmosus Reuter, 1876, Ofv. Svenska Vet.-Ak. Föhr. 32(9):76.
Shana Kirkaldy, 1902, Ent. 35:315.
Plexaris Kirkaldy, 1902, Ent. 35:282.
Type species: Cimex olivaceus Fabricius, 1776 (fixed by Distant,

Carvalho (1957) gave a complete bibliography of the genus. The
above synomynical bibliography is intended to indicate the different
names that have been applied to the genus Deraeocoris.

Diagnosis of the most important characters of the genus
Deraeocoris:

Size ranging from 3.5 to 7.5 mm. Body oval to suboval, dorsum
punctate, except head and in some species, the scutellum, glabrous or
hairy, shiny. Head twice as wide as long; front more or less convex,
vertex usually slightly greater than width of an eye; carina separated
from collum by a groove; tylus well defined from front; rostrum
reaching at least middle coxae, in some species, surpassing hind coxae.

Antennae: first, third and fourth segments about the same length; segment II gradually and moderately enlarged toward apical end or nearly cylindrical, about length of other three segments combined, about thickness of segment I; pubescent or hairy usually with combination of short pubescent hairs and larger exerted hairs. Pronotum trapezoidal; width at base greater than length; collar present; disk of pronotum more or less convex, coarsely punctate, lateral margins nearly straight; rounded or carinate; calli moderately convex or flat, confluent, smooth and shining; Scutellum: triangular, more or less convex, punctate or impunctate. Hemelytra: punctuate, lateral margins straight or moderately convex, apical part strongly deflected at fracture before cuneus, surpassing tip of abdomen; membrane with two areoles, one small, the other larger, clear or infuscated; cuneus more finely punctate. Male in most species more elongate than female.

Legs: moderately long; femora hairy or pubescent; tibiae beset with long exerted hairs, hind tibiae generally with a distinct row of spines; (tibial comb variable); claws deeply cleft near base or only with slight indication of cleavage; arolia bristle-like, usually converging at tips. Parameres: left clasper curved, sensory lobe of variable shape, apical and also variable; right clasper elongate or slightly curved, frequently smaller than right clasper in size.

Vesica: gonopore region surrounded by more or less developed sclerotized plates; spicules variable in number, size and shapes, distal membranous lobes differ between species. Sclerotized rings: well developed, from simple to strongly twisted, attached to transverse connecting piece by posterior sclerite; rings widely or narrowly
separated; dorsal and ventral labiate plates (F and G structures) usually present. Posterior wall of bursa copulatrix: consisting of simple plate, with pair of sclerotized lobes (A structure) narrowly or broadly connected usually; dorsal and ventral parts of posterior wall membranous; sclerotized knob (homologous to B structure) often present on meson; posterior wall showing specific differences.

Knight (1921) recognized three subgenera in the North American Deraeocoris; Deraeocoris Kirschbaum, Camptobrochis Fieber and Euarmosus Reuter. The subgenus Camptobrochis Fieber includes species that have a punctuate scutellum and deeply cleft claws. He placed his Group VI in the subgenus Euarmosus Reuter. The remaining species were included in the nominal subgenus Deraeocoris. Representative of each of Knight's six species groups are found in Oregon.

The following key was designed for identification of the species of Deraeocoris, presently known to occur in Oregon.

Key to the Species of Deraeocoris of Oregon

1. Scutellum punctate ........................................ 2
   Scutellum impunctate ..................................... 7
2. Claw deeply cleft at base ................................. 3
   Claw not cleft or with only a slight indentation ......... 5
3. Membrane hyaline and dorsum black except for carina, white; relatively small species, 3.5 to 4 mm in length ......................... bakeri Knight
   Membrane variously infuscated, dorsum not entirely black .................................................. 4
4. Area in front of and between calli black; disk of pronotum black or piceous, often marked with pale near lateral margins; median line black ....... brevis (Uhler)
Area in front of and between calli pale;
median line of pronotum often indicated with pale ............... validus (Reuter)

5. Width of vertex of male equal to or smaller than width of an eye when viewed dorsally; membrane of female largely surpassing tip of abdomen; size approximately 5 mm in length ............... 6
Width of vertex of male greater than width of an eye; female strongly ovate and membrane barely covering tip of abdomen; relatively large species, 7 mm or more in length ............... piceicola Knight

6. Cuneus pale or yellowish on basal half, apical half dark brown or blackish at least on inner margin;
collum deep black ............... incertus Knight
Cuneus dark brown, marked with reddish on basal half; collum dark brownish ............... rufusculus Knight

7. Claw not cleft or with only a slight indentation ........ 8
Claw deeply cleft near bases ............... 11

8. Dorsum glabrous or only with fine, short and sparse pubescence; hairs on lateral margins and anterior angles of pronotum rarely exceeding 0.16 mm ............... 13
Dorsum distinctly hairy; long hairs always present on anterior angles and lateral margins of pronotum reaching 0.24 to 0.37 mm .................. species c

9. Head and scutellum not marked with dark brown or blackish; head yellowish with pale reddish spots; calli feruginous; cuneus reddish ........... rubroclarus Knight
Head and scutellum marked with blackish or dark brown; calli and cuneus not as above .................. 10

10. Large-sized species, male approximately 7.50 mm in length; area between calli white or pale yellowish; pubescence on lateral margins and anterior angles of pronotum not exceeding 0.16 mm .................. species a
Moderate-sized species, approximately 5 mm in length; calli as in species a, but small depression often present on middle of each callus; dorsum glabrous .................. species b

11. Dorsum glabrous or only with fine, short and sparse pubescence; hairs on lateral margin and anterior angle of pronotum rarely exceeding 0.16 mm .................. 12
Dorsum distinctly hairy; long hairs always present on anterior angles and lateral margins of pronotum, 0.24 to 0.32 mm in length .................. 15

12. Membrane hyaline; dorsum pallid, shining; scutellum pale, marked with piceous or blackish on median line; length of species usually under 5 mm .......... schwarzi (Uhler)
Membrane not hyaline, variously infuscated; 
description not as above .......................... 13

13. Scutellum yellowish red; part of head yellowish, 
not marked with black; dorsum usually deep black 
or largely black; body ovate; size 4.8 to 5.3 mm 
in length ............................... fulgidus (Van Duzee) 
Scutellum not yellowish red; head marked with 
dark brown; dorsum not black .......................... 14

14. Body elongate; calli often invaded with brownish; 
area behind calli not black; median line of pro- 
notal disk narrowly pale; lateral margin of 
pronotum narrowly carinate, nearly straight 
when viewed laterally ........................... fasciolus Knight 
Calli solid black; area behind calli blackish or 
black; median line of pronotal disk not marked 
with pale; disk of pronotum abruptly convex near 
lateral and posterior margin ........................ shastan Knight

15. Calli pale and outlined with black ........... cerachates Uhler 
Calli solid black or only invaded with pale at 
anticerior angles ................................. 16

16. Collum pale brownish or reddish; dorsum reddish 
brown, marked with piceous; tibia triannulate 
with reddish brown ............................ fenestratus (Van Duzee) 
Collum piceous, or brownish but at least 
laterally marked with piceous or black; dorsum 
yellowish pale marked with piceous, tibiae not 
distinctly triannulate ............................. fusifrons Knight
Deraeocoris bakeri Knight


D. bakeri Knight is closely related to D. brevis, but it is smaller in size and distinguished by many features: dorsum entirely black, except carina, white; membrane hyaline; genital claspers and posterior wall of bursa copulatrix very distinctive.

Male: Length. 3.52 to 4.00 mm. Head. Length 0.48 mm, vertex 0.40 mm, width 0.88 mm, black, smooth and shiny; yellowish or brownish median line sometimes present on frons and tylys; eyes of variable colors, red, black or dark brown; carina ivory-white; rostrum length 1.30 mm, reaching middle of mesal coxae. Antennae. Segment I, length 0.32 mm, segment II, 0.80 to 0.86 mm, slightly thicker at apex. Segment III 0.32 to 0.40 mm, segment IV 0.32 to 0.40 mm; all segments black and covered pale hairs (often reaching 0.10 mm) and pubescence. Pronotum. Length 0.96 to 1.12 mm, anterior angles 0.80 to 0.86 mm, width at base 1.52 to 1.60 mm; black, shiny, fine pubescence on lateral margin; calli convex, polished, black; scutellum, black and punctate, lateral margin and apex usually pale. Hemelytra. Maximum width 1.60 to 1.68 mm, black, punctate and glabrous; cuneus black, penetrate. Membrane hyaline, veins and areoles brownish. Legs. Reddish brown to piceous; femora piceous; tibiae banded with pale at middle and apex; tarsi, black; claws deeply cleft at bases.
Parameres. Left clasper curved, base conical when viewed dorsally, process of sensory lobe moderately developed, shaft nearly cylindrical and flattened before apex; apical process consisting of simple points; right clasper truncate at base, slightly curved in S-figure, apex with small, curved tooth (Figure 14). Phallotheca. Moderately sclerotized, pointed at base; basal plates weakly sclerotized; ductus seminis twisted and forming a complete loop before entering vesica; maximum length 0.61 mm, maximum width 0.24 mm (Figure 25). Vesica. Consisting of a proximal sclerotized part surrounding ductus seminis and gonopore and of a distal membranous part composed of two bilobate sacs, one produced ventrally, the other dorsally, one lobe terminated by a small sclerotized process; a cork-screw like process, flattened and hairy arising from a small median lobe (Figure 35).

Female: Length. 3.60 to 3.76 mm; maximum width 1.76 to 1.84 mm; very similar to the male but slightly broader; segment II of antennae, 0.80 to 0.96 mm, more slender. Sclerotized Rings. Narrowing mesal, posterior margin thicker than anterior and lateral margins; lateral margin depressed toward connection with posterior margin angle formed by anterior and lateral margin curving slightly dorsal; lateral and posterior margins fuse to form a sclerite which runs posteriorly; dorsal labiate plate or F structure adjacent to anterior margin of sclerotized ring. Rings symmetrical, widely separated (Figure 64). Posterior Wall (of Bursa Copulatrix). Consisting of a pair of simple A structures of interramal sclerites connected mesally by a narrow band; dorsal emargination broad and shallow, dorsal apices of sclerite pointed; ventral membranous part present. Maximum length 0.25 mm, maximum width 0.51 mm (Figure 48).

Material Examined: Oregon-Deschutes County. 12 Mi. S.E. of Bend, July 19, 1957, G.F. Kraft (OSU); 11 Mi. S.E. of Brothers, July 8-9, 1968, on sage and Chrysothanmus nauseasus. J.D. Lattin (OSU); 12 Mi. E. Redmond, Sept. 15, 1939, K. Gray and J. Schuh (OSU); Sisters, July 13, 1962, G.C. Eickwort (OSU); 14 Mi. E. of Sisters, 3100' elevation, Aug. 13, 1929, H.A. Scullen (OSU).


Material from the following states were also examined. California. Togo Lodge, Reno Lake, June 22, 1927, R.L. Usinger (CAS), Upper Alkali Lake, Modoc County, Aug. 2, 1922, C.L. Fox (CAS); Davis Creek, Modoc County, Aug. 2, 1922, C.L. Fox (CAS); Davis Creek, Modoc County, July 12, 1922, C.L. Fox (CAS); 20 Mi. N.W. Alturas, July 25, 1939, J. Schuh (OSU). Idaho. 20 Mi. N. of Boise, Boise 6, Sept. 7, 1972, C. Musgrave (OSU). Nevada. Reno, June 27, 1929, F.E. Blaisdall (CAS); Carson City, June 26, 1929, R.L. Usinger (CAS); 10 Mi. N.W. Vya,

Specimens Illustrated: Male and female, July 16, 1957, Deschutes County, Oregon, G.F. Kraft (OSU).

This species has been taken from July to September. It seems to occur only at elevations higher than 3000 feet. In Oregon it is only known from the part of the state east of the Cascade Mountains.

D. bakeri Knight has been collected from different host plants including Purshia tridentata (Pursh.) DC, Artemesia ludoviciana Nutt. and Chrysothamnus nauseasus (Pall.) Brit. No evidence of adult hibernation has been recorded.

Deraeocoris brevis (Uhler)


Deraeocoris brevis, Knowlton, 1946, Bull. Brooklyn Ent. Soc. XLI,
Larger in size than *D. bakeri* Knight; membrane infuscated at apex; dorsum black but variously invaded with pale brown; sensory lobe of left clasper more developed than in *D. bakeri*; posterior wall of bursa copulatrix differs from that of *D. bakeri* by having mesal connection not well differentiated. Variable in size.

**Male:** Length. 4.32 to 5.60 mm. **Head.** Length 0.48 to 0.56 mm, width 0.88 to 1.04 mm, vertex 0.40 to 0.48 mm; head black and shiny, except yellowish spots near margin of eyes, behind antennae, on tylus and short median line on frons; pale spots may be present or not, size variable when present. Eyes piceous black to reddish. Carina ivory white. **Collum** black and shiny. **Rostrum,** length 1.36 to 1.76 mm, piceous, slightly paler between segments, tip reaching middle of mesocoxae. **Antennae.** Length segment I, 0.32 mm; segment II, 0.80 to 1.12 mm; segment III, 0.32 to 0.40 mm, segment IV, 0.32 to 0.40 mm; black to piceous. Apical half of segment II, III and IV covered with fine pubescence; longer hairs, reaching 0.01 mm, also present on each segment. **Pronotum.** Length 0.80 to 1.04 mm, anterior angles 0.80 to 0.96 mm, width at base 1.76 to 1.84 mm punctate; black, sometimes pale on each side near lateral margins, but median area of disk always black. **Collar** pale to white. Calli black, shiny, impunctate; slightly convex; lateral margin and posterior margins of disk narrowly white. Scutellum coarsely punctate except near margins and apex, black except narrowly on basal half of lateral margins and apex, pale to ivory white. **Hemelytra.** Width 1.92 to 2.24 mm; punctate, black to piceous except yellowish translucent at base of corium and embolium, in lighter
colored specimens, basal half of corium and embolium, claws and median area of corium invaded with pale yellowish; in very light colored specimens only apical margin of corium is black to piceous. Cuneus. Longer than head, punctate, black to piceous except basal area, pale yellowish and translucent. Membrane clear, apical half infuscated; veins and areoles fuscious. Legs. Black to piceous; hind femur annulated with reddish near apex; tibia annulated with pale near base, at middle and near apex; tibia with a row of distinct spines on anterior face, also covered with shorter hairs and long pubescence, tarsi piceous finely pubescent; claws deeply cleft near base. Venter. Black and shiny, covered with pale hairs. Parameres. Similar to D. bakeri Knight in general aspect; sensory lobe of left clasper developed into protruding and rounded process; shaft dorso-ventrally flattened, apical end and apex curved. Right clasper elongate, flattened, sensory lobe slightly convex; apical process curved (Figure 15). Phallotheca. Very similar to D. bakeri Knight; ductus seminis forming a complete loop before entering vesica; maximum length 0.54 mm; maximum width 0.24 mm (Figure 26). Vesica. Structurally similar to D. bakeri Knight, with four membranous lobes, two lobes ending with small apical process; median cork-screw-like process well developed, covered with small bristles (Figure 36).

Female: Length. 4.32 to 4.96 mm; maximum width 1.92 to 2.24 mm; very similar to the male, generally shorter, segment II of antennae, slender, gradually thickened toward apex, yellowish at middle.

Sclerotized Rings. Similar to D. bakeri Knight, narrowing mesal posterior and lateral margins thicker than anterior margin, anterior and lateral margins in more ventral position than posterior margin; angle
formed by posterior and lateral curves slightly dorsal; lateral margin and posterior margin coalesce to form short posterior sclerite dorsal and ventral labiate plates distinct; rings symmetrical, widely separated (Figure 65). **Posterior Wall.** Mesal connection of interramal sclerite not distinct and not fully sclerotized; dorsal margin forming broad and shallow emargination; ventral half of posterior wall membranous. Maximum length 0.27 mm, maximum width 0.49 mm (Figure 49).

**Fifth Instar Nymph (Male):** **Length.** 2.56 mm to 2.88 mm; maximum width 1.44 mm to 1.76 mm. **Head.** Length 0.48 mm, width 0.80 mm, vertex 0.32 to 0.48 mm; pale yellowish, often tinged with reddish or brown on sides; bearing long (0.15 mm) black setae and shorter hairs. Eyes translucent to reddish. Carina convex. Tip of rostrum reaching middle of mesocoxae. **Antennae.** Length of segment I, 0.32 mm; segment II, 0.96 mm; segment III, 0.32 mm; segment IV, 0.32 mm; beset with black and long setae. Segment I and basal half of segment II translucent; remaining part of antennae brownish or fuscous. **Pronotum.** Length 0.64 mm; anterior angles, 0.64 mm; width of base 1.28 mm; nearly flat, beset with long setae, depressed along median line; pale yellowish, tinged with fuscous. Calli fuscous. Mesonotum and wing pads piceous at apices and around scutellum. **Legs.** As in adults, except paler in coloration, pale annulation on femora obscure; tibiae with three pale annulations; tarsi piceous at base and apex. Claws piceous and deeply cleft at bases. **Abdomen.** Pale yellowish, tinged with red between margins of each segment and often at the insertion of setae; dorsum clothed with long black setae and shorter pale hairs. Dorsal abdominal gland piceous, on middle of third tergite and invading anterior half of fourth tergite. One pair of spiracles present on sublateral area of
abdominal segment due to seven. The nymphs of *D. brevis* (Uhler), are covered with a white powdery substance.

**Holotype.** Female August 10, Las Vegas, New Mexico, H.S. Barber (USNM Cat. No. 6851).


California. Mt. Hebron, Siskiyou County, Aug. 5, 1967, J. Schuh (OSU); Weed, Aug. 10, 1961, B. Ainscough (OSU); Shasta City, Aug. 8, 1956, J. Schuh (OSU); Hills back of Oakland, June 12, 1908, E.C. Van Dyke (CAS); Mt. Diablo, July 14, 1916, E.P. Van Duzee (CAS); Yosemite Val., July 11, 1925, E.H. Nart (CAS); Shasta Spgs., June 10, 1920, C.L. Fox (CAS); Mill Cr. Cn., San Bernardino Co., Sept. 24, 1923, E.C. Van Dyke (CAS); Kings R. Cyn., Fresno Co., July 4, 1910, E.C. Van Dyke (CAS); Sacramento, April 23, 1922, E.P. Van Duzee (CAS); Strawberry Val., Eldorado Co., Aug. 16, 1912, E.C. Van Dyke (CAS); Pentz, Butte Co., May 22, 1928, H.H. Keifer (CAS); Davis Creek, Warner Mts., Modoc Co., July 17, 1922, C.L. Fox (CAS); Oroville, July 12, 1926, H.H. Keifer (CAS); Meadow Val., Plumas Co., 4000 to 5000' elevation, July 22, 1924, E.C. Van Dyke (CAS); Dry Lake Sta. 7000' elevation, Siskiyou Co., June 1, 1920, C.L. Fox (CAS); Placer Co., 6000' elevation, Aug. 27, 1916, W.M. Giffard (CAS); Fallen Leaf, Eldorado Co., Aug. 21, W.M. Giffard (CAS); Wawona Mariposa Co., June 17, 1916, W.M. Giffard

Material Illustrated: Male, April 21, 1977, Female, May 27, 1977, Corvallis, J.D. Lattin (OSU). D. brevis (Uhler) shows a great deal of color variation.

The variety piceatus Knight appears to be the most common form of this species in Oregon. It is considered only as a color variety and its subspecific rank is not recognized here. The two color forms are often encountered in the same population at different percentages and there is no distinct geographical distribution of the two color forms.

This species is widely distributed in Oregon, except on the coast. It has been recorded from most of the western states. It has been collected from many plant species, including: Amelanchier alnifola Nutt.,
Arbustus menziesii Pursh., Ceanothus velutinus Dougl., Arctostaphylos sp., Chamaebotaria millefolium Maxim., Pinus ponderosa Dougl., Pinus contorta Dougl., Castanopsis sp., Ribes sp., Rubus sp., etc. Although this species lives mostly on perennial trees and shrubs, it has been also collected from plants like alfalfa. *D. brevis* is quite common on orchard trees. This species has been reported to feed upon a wide range of small arthropods, including: mites, aphids, psyllids, leafhopper nymphs and lepidopterous larvae.

*D. brevis* overwinters as adult, hidden under loose bark of trees. It has several generations per year. According to McMullen and Jong (1967) it has at least four generations per year. This species has been reported by many authors as being of importance in the control of orchard pests (McMullen and Jong, 1967; Westigard, 1973).

**Deraeocoris validus** (Reuter)


Closely related to *D. brevis* (Uhler); area before calli pale; median line of pronotum and scutellum indicated with pale. Parameres and vesica showing relationship with *D. bakeri* Knight and *D. brevis* Uhler; posterior wall distinctive of the species.

**Male:** Length. 4.48 to 4.64 mm. **Head.** Length 0.48 to 0.64 mm;
width 0.88 to 0.96 mm; vertex, 0.40 mm; more or less pale; piceous to black spots, along carina and curving forward on front, on each side of basal half and at apex of tylus, on lora, buccola, and part of gena. Carina yellowish pale. Eyes piceous to reddish pale. Rostrum, length 1.44 to 1.68 mm, tip reaching middle coxae, piceous, pale between segments. Collum black. Antennae. Segment I, length 0.32 to 0.40 mm; segment II, 1.12 mm; segment III, 0.40 to 0.48 mm; segment IV, 0.32 to 0.40 mm. Segment II nearly cylindrical but constricted at base; segments covered with dense and fine pubescence and several longer pale hairs. Pronotum. Length 0.96 to 1.04 mm; anterior angles 0.24 to 0.88 mm; width at base 1.68 to 1.76 mm; brownish testaceous; punctate; posterior margin of disk slenderly pale; calli black, area before and between calli pale. Anterior angles of calli often invaded with pale. Scutellum, brownish testaceous, with black punctures, median line pale, lateral margins and apex ivory white. Pronotum and scutellum sparsely pubescent. Hemelytra. Width 1.92 to 2.08 mm; sparsely pubescent, brownish testaceous to yellowish pale, apical regions are claws and corium and small spot at middle of corium, usually piceous. Cuneus pale to brownish, punctate, translucent, apical half piceous. Membrane clear, apical half infurcated, veins piceous, slightly invading on membrane. Legs. Pale with piceous or dark brown; covered with hairs; hind and middle femora biannulate with brown to piceous on apical half; hind femora with two rows of piceous spots on anterior face, tibiae triannulate with brown to piceous; tarsi pale, apical segment and claws piceous, claws deeply cleft. Venter. Black to piceous, shiny, with five, pale pubescence. Parameres. Similar to D. bakeri Knight, but larger in size; sensory lobe of left clasper not as developed as in
D. brevis (Uhler); right clasper small, with tubercle on inner margin before apex (Figure 16). Phallotheca. Same structures as in D. brevis (Uhler) and D. bakeri but larger in size; base of phallotheca rounded when viewed dorsally; basal plates heavily sclerotized, primary gonopore weakly sclerotized. Maximum length 0.78 mm; maximum width 0.33 mm (Figure 27). Vesica. Four membranous lobes, two terminated by small apical processes; corkscrew-like process flattened and long; structures of vesica suggest close relationship between this species, D. bakeri Knight and D. brevis (Uhler) (Figure 37).

Female: Length. 4.64 to 5.04 mm; width 2.00 to 2.24 mm; very similar to the male but slightly larger in size. Segment II of antennae, length 0.96 to 1.04 mm; slender and gradually thickening toward apex, pale at middle. Sclerotized Rings. Triangular-shaped; margins about same thickness, anterior margin depressed; posterior and later margin coalesce posteriorly to form slender sclerite which runs candid; dorsal and ventral labiate plates well developed, adjacent to anterior and posterior margins. Ring symmetrical and widely separated. Posterio Wall. A structure usually connected by a narrow band. Dorsal emargination narrower and deeper than in D. bakeri Knight. Ventral membranous part forming two round lobes. Maximum length 0.37 mm, maximum width 0.48 mm (Figure 50).

Fifth Instar Nymph (Male): Length. 2.88 mm, maximum width 1.72 mm. Head. Length 0.64 mm, width 0.88 mm, vertex 0.48 mm, dark brown with pale median line on front, vertex and along inner margins of eyes; beset with long dark setae and pale shorter hairs. Eyes reddish brown, carina convex, white, brown near eyes. Carina with a row of spines on its anterior margin. Rostrum two first segments pale, apical segments
piceous, tip reaching middle of mescoxae. **Antennae.** Piceous, bearing long setae (0.16 mm) and finer hairs; segment I, length 0.32 mm; segment II 0.96 mm, nearly cylindrical, constricted at base, darker at apex; segment III, 0.40 mm; segment IV, 0.40 mm. **Pronotum.** Length 0.64 mm, width at base 1.20 mm, anterior angles 0.88 mm, brownish, marked with white median line. Central areas of pronotal disk convex, beset with black setae and pale hairs except in calli; calli rugose, piceous with two oblique and pale lines. Mesonotum and wing pads yellowish brown, apices piceous. Scutellum marked with white median line. Mesonotum, wing pads, beset with long dark setae and pale hairs. **Abdomen.** Pale, tinged with reddish; covered with hairs and setae. First and second tergites brownish; dorsal abdominal gland on median part of third tergite invading anterior half of the fourth, abdominal segments due to seven having a pair of spiracles on sublateral area of each segment; base of each segment marked with red. **Legs.** Very similar to that of adult. Middle and hind femora biannulate with dark brown; hind femora with two rows of dark spots on its anterior face; tibia, triannulate with dark brown; tarsi and claws piceous, claws, cleft near bases.

The nymph of *D. validus* Reuter is also covered with a white powdery substance as is *D. brevis* (Uhler).

**Holotype:** Male. Portland, Oregon, Aug. 12, A.A. Nichol (USNM).

Columbia River, Sept. 14, 1961 (OSU). Klamath County. 10 Mi. N.W.
Klamath Falls, Wocus Marsh, May 23, 1958, J.D. Lattin (OSU). Yamhill
California. Lakeport, Aug. 2, 1915, E.P. Van Duzee (CAS); Palo Alto,
Sept. 1908, J.C. Bradley (CAS); Clear Lake, Oct. 18, 1931, E.P.
Van Duzee (CAS). Washington. Seattle, June 1960, Trantow (OSU); Cedar
Mt. King County, May 2, 1930, "C.C." (OSU).

Material Illustrated: Male and female, May 4, 1961, Corvallis,
J.D. Lattin (OSU).

The biology of this species is not known. Collection records
indicate, however, that it overwinters in the adult stage. The nymph
described above has been caught in late fall. This species has at
least two generations per year. It has been collected along rivers and
creeks and on Salix spp. in Oregon. The author has collected this
species along with a few species of aphids; it may be assumed to have
a predatory habit.

Deraeocoris incertus Knight

Deraeocoris incertus Knight, 1921, Rept. Minn. St. Ent. 18: 111

General external aspect similar to D. validus Reuter; claws not
deeply cleft near bases; male vertex when viewed dorsally, smaller than
width of an eye.

Male: Length. 5.12 mm. Head. Length 0.64 mm, vertex 0.32 mm,
width 0.96 mm, pale yellowish to pale reddish brown; black markings on
proux, vertex and tylus very similar to D. validus Reuter. Carina
scarcely convex, slightly curving forward. Collum black. Vertex
smaller than the width of an eye. Rostrum piceous, length 1.92 mm, tip reaching hind coxae. Antennae. Segment I length, 0.32 mm; segment II, 1.44 mm; segment III, 0.40 mm; segment IV, 0.40 mm; segment II, black nearly cylindrical, narrowed at base and apex, pale pubescent and beset with a few exserted hairs; last two segments black and pale pubescent. Pronotum. Length 1.12 mm; width 1.92 mm; anterior angles 1.04 mm; pale yellowish to pale reddish yellow, marked with dark brown spots; disk nearly glabrous, shiny and irregularly punctate; median line and basal margin slenderly white. Calli black, shining, slightly convex; area before and between calli, pale. Scutellum, black or dark brown with apex and basal angles pale yellowish; median line of scutellum indicated with pale. Sternum and pleura black, scent gland opening white. Hemelytra. Width, 1.92 mm; pale, middle and apical half of corium and claws testaceous. Cuneus pale with black punctures, apical half dark brown. Membrane infuscated, but clear behind the apex of cuneus and areoles. Veins dark brown, invading slightly on membrane. Legs. Reddish brown; hind femora with three pale bands at middle and rear apex; tibiae biannulate, pale annulation near knee incomplete; tarsi blackish; claws infuscated, translucent, not cleft near base. Venter. Blackish, shining, anterior margin of each segment marked with pale. Parameres. Left clasper, sensory lobe well developed and rounded at apex as in D. brevis (Uhler), shaft flattened, curving and narrowing before apical end, apex curved; right clasper truncate at base, inner margin rounded and convex, apex curved (Figure 16). Phallotheca. Base rounded when viewed dorsally, ductus seminis and vesica showing similarity to D. validus (Reuter), when not inflated, with two membranous lobes ended with sclerotized process (Figure 28).
Vesica. Inflates only moderately, compared to D. validus (Reuter). Membranous part of vesica surrounded by sclerotized ridges, limiting their inflation; the vesica has three membranous lobes with sclerotized apical process. Corkscrew-like process, present and covered with small bristles; two short spiculi also visible (Figure 38).

Female: Length. 5.28 mm; width 2.16 mm; vertex larger than width of eye; segment II of antennae, length 1.60 mm; basal half more slender, thickening gradually toward apex. Anterior angles of calli invaded with pale. Sclerotized Rings. Triangularly-shaped, narrowing mesal; margins of ring about same thickness; lateral margin slightly depressed; from angle formed by lateral and posterior margins arises a sclerite which narrows gradually caudal. This sclerite attached to first rami and transversal connecting piece, supporting the rings. Dorsal labiate plate surrounds anterior margin of ring. Rings are widely separated and symmetrical (Figure 67). Posterior Wall. Pair of A structure connected mesally by narrow band; lobes of A structures rounded at apices; dorsal margin of A structure broad and shallow; A structures surrounded by membranous part, very shallow; mesal connection with a small knob on its ventral margin. Maximum length 0.41 mm; maximum width 0.54 mm.

The description of the male is based on two males that have been compared with the type specimen by Dr. Lattin, and a female taken with the male.

Holotype: Male, Aug. 12, Portland, Oregon, A.A. Nichol (USNM).

Material Examined: Oregon - Benton County. Berry Creek, 9 Mi. N. Corvallis, Aug. 24, 1964, D.R. Smith (OSU); 4 Mi. N.E. Alsea, Sept. 27, 1967, D.R. Smith (OSU); Corvallis, July 14, 1941, J. Schuh (OSU);


Very little is known about this species. In Washington, it has been collected from Douglas-fir, Pseudotsuga menziesii (Mirb.), in association with chermids and in California from Abies shastensis. Collection records indicate that it may have two generations per year.

**Deraeocoris rufusculus Knight**


Very similar to D. incertus Knight, although small differences are found in the parameres, sclerotized rings and posterior wall.

**Male:** Length. 5.44 mm. Head. Length, 0.64 mm; vertex 0.32 mm; width, 1.04 mm; markings on the head identical to D. incertus; collum dark brown; other characteristics of head similar to D. incertus Knight. Antennae. Segment I, length 0.31; segment II, 1.76 mm;
segment III, 0.40 mm; segment IV, 0.40 mm; brownish, segment I almost
glabrous; segment II nearly cylindrical, constricted at base, pale
pubescent and with few longer hairs at regular interval. **Pronotum.**
Length 0.96 mm, anterior angles 0.80 mm, width at base 1.76 mm. Very
similar to *D. incertus* Knight, pale yellowish with dark brown spots,
median line and basal margin, slenderly white. Calli as in *D. incertus*;
scutellum dark brown, apex and basal angles pale, median line shortly
indicated with pale near apex. **Hemelytra.** Width 2.24 mm, darker in
color than *D. incertus*, dark brown and translucent, pale near base of
embolium, cuneus reddish brown, slenderly pale near basal margin.
Membrane and veins as in *D. incertus*. **Legs.** As in *D. incertus*. **Para-
mere.** Similar to *D. incertus* in general appearance, but shaft of left
clasper more enlarged; right clasper very similar, but apical region
shorter (Figure 17). **Phallotheca and Vesica.** Identical to *D. incertus*
(not illustrated).

**Female:** **Length.** 5.44 mm, width 2.24 mm; same size as male; but
paler in general coloration; segment II of antennae, length 1.46 mm.
Vertex wider than an eye. Cuneus of female paler in coloration, only
apical half of margin marked with dark brown. **Sclerotized Rings.**
Similar to *D. incertus* but anterior margin twisting upward; adjacent
sclerites more heavily sclerotized (Figure 68). **Posterior Wall.** Simi-
lar to *D. incertus*, but apex of lobes of A structure more pointed, and
their dorsal emargination narrower and deeper; dorsal membranous part
less important than in *D. incertus*; mesal connection without a small
knob. Maximum length, 0.35 mm; maximum width 0.46 mm (Figure 52).

**Holotype:** Male, Aug. 12, Portland, Oregon, A.A. Nichol (USNM).
**Material Examined:** One Mi. S. Hyatt Reservoir, Jackson Co.,
Oregon, Aug. 4, 1956, on Abies sp., J. Schuh (OSU).

The material illustrated has the same records. This species has been collected from Abies sp. in Oregon.

This species is very closely related to D. incertus Knight. It may be questioned whether the morphological differences between these species are enough to separate them into two distinct species. This problem cannot be solved without a complete study of their range of distribution.

Deraeocoris piceicola Knight


General aspect and structure of D. incertus Knight but much larger in size; vertex of male larger than width of an eye; female strongly ovate, tip of hemelytra barely surpassing abdomen; right clasper elongate; posterior wall distinctive for the species.

Male: Length. 7.84 mm. Head. Length 0.88 mm, width 1.12 mm, vertex 0.56 mm, black; median line each side of tylus and near its tip, trapezoidal spot on vertex and slenderly from the anterior angles of this spot to antennae, pale, carina flat, separated from collum by a groove. Rostrum length 2.56 mm, tip reaching posterior margin of middle coxae, piceous, pale between segments. Antennae. Segment I, length 0.54 mm; segment II, 1.68 mm; segment III, 0.80 mm; segment IV, 0.48 mm; piceous, shining, sparsely pubescent, last three segments with longer pale hairs (0.08 mm). Segment II cylindrical but slightly slender on basal half. Pronotum. Length 1.28 mm, anterior angles 0.96 mm, width at base 2.16 mm; brownish and irregularly punctate; calli
black, shiny, anterior angles of calli marked with deep punctures, pale area before and between calli invading anterior angle; median line, and posterior margin narrowly pale; pubescence of pronotum arise from punctures. Scutellum black, punctate, shining, basal angles and apex pale, median line incompletely indicated with pale; hairs arise from punctures of scutellum. Hemelytra. Width 2.80 mm, brownish, marked with pale near middle and apex of corium and are claws; punctures black; sparsely pubescent. Cuneus dark brown, basal half pale and opaque, punctures black. Membrane infuscated on apical half, pale behind cuneus, veins and adjacent area fuscus. Legs. Brownish; femora plaer on basal half and marked with red near apices; itliae biannulated with pale. Tarsi brownish in claws piceous. Parameres. Relatively large in size, left clasper gently curved, base truncate, sensory lobe well developed and conical, shaft flattened and broad, narrowing before apex, apical process curved, right clasper very elongate, narrowing gradually toward apex (Figure 18). Phallotheca. Large in size; weakly sclerotized, ductus seminis not looped as in all previous species, surrounded by a sclerotized flap distally, one spicule visible (Figure 29). Vesica. Rather simple structurally; sclerotized flaps surround distal parts of ductus seminis; membranous part consisting of one lobe with a small diverticulum; sclerotized on short spicule arise from the base of diverticulum (Figure 39).

Female: Length. 7.84 mm, width 3.08 mm; segment II of antennae, length 1.76 mm; slender, apical one-third thicker and darker; similar to male but more robust and strongly ovate; hemelytra not surpassing the tip of abdomen. Sclerotized Rings. Narrowing mesal; anterior and posterior margin curving dorsal; lateral margin and posterior margin
produced in posterior position, lateral margin very thick and heavily sclerotized; posterior sclerite attached to lateral margin and part of anterior margin; sclerite narrowing caudad, and attached to transverse connecting piece. Dorsal labiate plate relatively large, surrounding anterior and posterior margin of ring (Figure 70). **Posterior Wall.**

Pair of A structures extending dorsal and ventral fused mesally by narrow band, dorsal emargination broad and shallow, ventral emargination deep and nearly circular; dorsal membranous part reduced; ventral membranous part forming two separate lobes with deep and narrow emargination; small knob, analogous to B structure present on mesal. Maximum length 0.63 mm, maximum width 0.87 mm (Figure 53).

**Holotype:** Male, Aug. 20, 1921, Pingree Park, altitude 9000', Colorado, H.H. Knight, (USNM).


The above description is based on specimens compared with the types by Dr. J.D. Lattin.

**Material Illustrated:** Male, Frog Camp, E. of Rainbow, Lane Co.,
Oregon, Aug. 8, 1959, J.D. Lattin (OSU); female, Kelley Cr., 14 Mi. S. of Lakeview, July 12, 1960, P. Oman (OSU).

This species had been collected from Abies amabilis (Forbes) and Abies procera Rehd., in Oregon. In his description of the species, Knight (1927) mentioned that the type series have been taken from Picea sp. "Only on trees badly infested with aphid galls." The prey species for D. piceicola in Oregon are not yet known.

Deraeocoris fasciolus Knight


Relatively large species; form elongate; membrane distinctive with rounded spot at apex. Sensory lobe of left clasper short and rounded; posterior wall distinctive for species.

Male: Length. 6.56 mm. Head. Length, 0.72 mm; width 1.04 mm; vertex, 0.48 mm; yellowish to pale brownish; dark brown or piceous spots, longitudinally on each side of tylus, five transverse spots sometimes partially fused on each side of median line, on each side of vertex and behind antennae. Rostrum length 2.16 mm, yellowish except apical segment dark brown, apex attaching posterior margin of middle coxae. Antennae. Segment I, length 0.56 mm; segment II, 1.60 mm; segment III, 0.74 mm; segment IV, 0.48 mm; dark brown, pale pubescent;
segment II covered with erect hairs, often reaching 0.08 mm. **Pronotum.** Length 1.36 mm, width at anterior angles 0.96 mm, width at base 2.24 mm; irregularly punctate; uniformly brown, sometimes paler on median line. Calli piceous to black, often invaded with pale on anterior angles; scutellum impunctate, dark brown except basal angles, apex and median line pale. **Hemelytra.** Width 2.80 mm; punctate, brownish with dark brown spots on apical half of corium; basal two-thirds of embolium pale or translucent. Cuneus, finely punctate, pale transluscent, infuscated at apex. Membrane clear, areole infuscated, rounded spot at apex connected to mesally to infuscation of areoles. **Legs.** Pale or yellowish; hind femur with two dark brown to blackish annulations on apical half; tibia biannulate on basal half, dark spot at apex, hind tarsus dark brownish, darker at apex, claws deeply cleft near base. **Venter.** Reddish brown, shiny, covered with long pale hairs (0.16 mm). **Parameres.** Left clasper, process of sensory lobe short and rounded, shaft flattened, with a little expansion at middle, narrowing before apex, apical process T-shaped; right clasper expanded at middle, narrowing toward apex, apical process as in left clasper (Figure 19). **Phallotheca.** Relatively large, ductus seminis curving nearly at right angle before entering vesica; proximally, ductus seminis surrounded by two sclerotized flaps; basal plates heavily sclerotized, base of phallotheca dome-shaped when viewed dorsally. Maximum length 1.52 mm, maximum width 0.70 mm. **Vesica.** With two membranous asymmetrical lobes, larger lobe with small lateral expansion; four sclerotized spiculi arise from gonopore region, one spiraled and three others nearly straight (Figure 40).

**Female:** **Length.** 6.50 mm, maximum width 3.20 mm; length of
antennal segment II 1.68 mm, slender and slightly thicker at apex, blackish, paler at middle. Similar to male. Sclerotized Rings. Narrowing mesal, anterior margin curved, posterior margin strongly depressed near latero-posterior angle; posterior sclerites arise from latero-posterior angle and run caudad, narrowing toward their apices; dorsal and ventral labiate plates adjacent to anterior margin of ring; rings widely separated, but connected mesally by connecting transverse piece, which is attached to the first rami and the posterior sclerites. Posterior Wall. One pair of A structures narrowly and shortly connected mesally; dorsal part of each sclerite "crescent-shaped" cut, dorsal emargination deep and narrow; relatively large sclerotized knob present on meson, probably analogous to B structure; ventral membranous part reduced. Maximum width 1.70 mm; maximum length 1.52 mm.

The above descriptions based on male and female compared with the type by Dr. J.D. Lattin.

Fifth Instar Nymph (Male): Length. 3.68 mm, maximum width 2.56 mm. Body covered with black setae and finer pale hairs. Head. Length 0.64 mm, vertex 0.54 mm, width 0.96 mm, brownish, slightly paler on frons and near eye margin; eyes reddish brown; carina convex; rostrum length 1.92 mm, piceous. Antennae. Length of segment I, 0.32 mm; segment II, 0.96 mm; segment III, 0.48 mm; segment IV, 0.48 mm; pale brownish, covered long pale haris (0.08 mm), black setae found on the first two segments. Pronotum. Length 0.80 mm, width of vertex 0.54 mm, width at base 1.60 mm, pale yellowish. Calli slightly convex and marked with dark brown. Mesonotum and wing pads yellowish brown, dark brown at apex. Scutellum convex, median line indicated with pale. Legs. Pale yellowish, hind femora with incomplete brown marking near
apices; tibiae apparently triannulate with brown; tarsi darker on apex of apical segment; claws piceous, deeply cleft. Abdomen. Dorsum yellowish brown, tinged with red, dorsal abdominal gland forming a triangular median spot on abdominal segment II, III and anterior half of IV. Apex of abdomen marked with dark brown. Venter pale yellowish, one pair of spiracles visible on sublateral area of segments I to VII.

The nymphs of this species are covered with a white powdery substance.

Holotype: Male, July 8, Ithaca, New York, H.H. Knight (USNM).


Material Illustrated: Male and female, Salem, Oregon, July 17, 1959, N.P. Larson (OSU).

In Oregon, this species has been collected from filbert trees and hazel. It has been observed in the laboratory, feeding on a large variety of small insects, including aphids and psyllids. McMullen (1967) reported that D. fasciolus Knight is a predator of the pear psylla in British Columbia. According to Chaddoria (1967), nymphs and adults of this species are predators of the apple mealy bug in Nova Scotia. D. fasciolus Knight has two generations per year and
overwinters in the egg stage, according to McMullen (1967). This species has a northern distribution ranging from coast to coast, north of 40° latitude (Batchley, 1927).

**Deraeocoris shastan** Knight


Pronotum strongly convex near lateral and posterior margins, dark brown or black, except before calli and lateral margin pale; scutellum impunctate, black except basal angles and median line pale, pale median line not reaching base, sensory lobe of left clasper distinctive for the species.

**Male:** Length. 5.76 mm. **Head.** Length 0.80 mm, width 1.04 mm, vertex 0.48 mm, pale yellowish, spots on each side of vertex, along inner margins of eyes and behind antennae, on each side of median line of frons, longitudinally on each side of basal half, narrowly at tip and a large spot behind base of tylus, on lorae and juga, black. Carina slightly convex on each side of median line. **Collum** black; rostrum, length 1.92 mm, dark brownish or piceous except basal two-thirds of a second segment pale yellowish, tip reaching hind margin of mesocoxae. **Antennae.** Brownish; segment I, length 0.48 mm; segment II, 1.28 mm; apical three-fourths heavily pubescent, with few exserted hairs reaching 0.16 mm; segment III, 0.64 mm; segment IV, 0.48 mm; last two segments densely pubescent and with few exserted hairs. **Pronotum.** Anterior angles, 0.96 mm; length, 1.12 mm; width at base 2.24 mm; irregularly punctate, black except sides pale; disk convex, abrupt near lateral and posterior margin. **Calli** black and convex; area before calli
pale yellowish; black arc extending from each anterior angle of calli to anterior margin of pronotum. Scutellum, black except basal angles and apical half of median line, pale. Hemelytra. Width 2.24 mm; pale yellowish, punctures black; largely blackish at apex, at middle and base of conium, and narrowly at base; claws black at base and apex, and along margin. Cuneus pale, inner basal angle and apex black. Membrane pale, apical half fumate, veins dark brown, black posteriorly, slightly invading on membrane. Legs. Pale, femora with a large black band on apical half, and another slender, paler band near apex; tibiae tri-annulate with blackish; tarsi pale, darker at apex; claws piceous, deeply cleft near base. Parameres. Sensory lobe of left clasper distinctive for species with elongate and slender process.

Holotype: Male, May 28, Siskiyou County, California (F.W. Nunnenmacher) (USNM).


The vesica and phalotheca of the species has not been studied because the specimen from Oregon was received too late. However, there is no doubt about the identity of this specimen. The sensory lobe of the left clasper is very distinctive of this species. Furthermore, it was taken in the same region as the type locality of the species (Siskiyou County, California).
Deraeocoris schwarzi (Uhler)


About the size of D. validus (Reuter); body ovate; scutellum impunctate, pale, median line dark, coloration generally pale, but corium variously marked with blackish; sensory lobe of left clasper elongate, narrowing before its apex.

**Male:** Length 4.48 to 4.80 mm. **Head.** Length 0.64 mm, vertex 0.48 mm, width 0.96 mm, pale marked with dark spots on each side of ventex, on each side of median line of frons, at base and each side of median line of tylus, behind antennae, along inner margin of eyes, transversely on tip of tylus and on juga. Carina flat, separated by a groove from collum. **Rostrum** length 1.68 mm, pale, piceous at apex, reaching hind of middle coxae. **Antennae.** Length of segment I, 0.32 mm; segment II, 1.12 mm; segment III, 0.48 mm; segment IV, 0.40 mm; pale brownish, becoming darker at apex of segment II; last two segments blackish; segment II thickened toward apex; antennae covered with pale pubescence and larger dark hairs. **Pronotum.** Length 0.96 mm, anterior angles 0.88 mm, width at base 2.00 mm, pale, with coarse black punctures. Calli slightly convex, black; area before and between calli,
pale; anterior angles of calli invaded with pale, black ray extended from anterior angle of each calli to anterior margin of pronotum. Sometimes central area of disk marked with blackish on each side of median line. Scutellum, convex, impunctate and pale, broadly blackish on median line. Hemelytra. Width 2.32 mm, opaque pale; punctures black; middle area of corium and area extending toward apical margin, marked with dark brown. Cuneus pale except inner margin at apex dark brown. Membrane clear; veins light brown. Legs. Pale, coxae dark brown at base; femora triannulate with dark brown on apical half, two distinct rows of brown spots often visible on anterior face of hind femur; tibia biaannulate with dark brown on basal half; tarsi darker at apex; claws cleft near bases. Venter. Piceous, shiny, finely pubescent; median area of first five segments paler. Parameres. Left clasper - base truncate, sensory lobe elongate, narrowing before its apex, shaft moderately curved, flattened, very narrow before apex, apical process curved; right clasper expanded at middle and narrow to base and apex; apical process curved (Figure 20). Phallotheca. Ductus seminis relatively short; four spiculi arising from the gonopore region; base of phallotheca dome-shaped when viewed dorsally, maximum length 1.02 mm; maximum width 0.54 mm (Figure 31). Vesica. Similar to D. fasciolus Knight, with four sclerotized spiculi; membranous lobe surrounding base of each spiculus, principal membranous lobe with a lateral diverticulum (Figure 41).

Female: Length. 4.72 mm, maximum width 2.56. Very similar to the male in color and size although more robust. Antennal segment II length 1.12 mm; slender, thickening gradually toward apex; pale, darker at apex. Sclerotized Rings. Narrowing mesad; lateral margin or ring
curves dorsally and coalesces ventrally with posterior margin to form a relatively short and slender sclerite which runs caudad; rings not as widely separated as in *D. fasciolus* Knight, connected by a broad transverse sclerite; dorsal labiate plate adjacent to anterior margin of ring. **Posterior Wall.** Pair of A structures narrowly connected mesally; dorsal extension of each sclerite rounded at apex; dorsal emargination of A structures V-shaped, dorsal membranous part present; sclerotized knob analogous to B structure or process, on meson, ventral membranous part reduced; maximum length 0.48 mm, maximum width 0.63 mm.

**Holotype:** Male, June 22, 1891, American Fork, Utah, E.A. Schwarz (USNM).


**Specimens Illustrated:** Male and female, lower Klamath Lake Hill, July 19, 1963, J. Schuh (OSU).

In Oregon, this species has been taken from Artemisia sp. Little is known about its biology. It seems to be adapted to fairly dry climates. *D. schwarzii* Uhler is known from Oregon, California, Idaho, Nevada and Washington. Contrary to Van Duzee (1914) and unlike most species, only a moderate variation in color pattern has been found in *D. schwarzii* Uhler in Oregon.
**Deraeocoris fulgidus** (Van Duzee)


Shining black; body ovate, scutellum reddish, head fulvous; genitalia showing relationship with *D. schwarzii* (Uhler).

**Male:** Length. 4.72 to 5.28 mm. Head. Length 0.56 to 0.72 mm, vertex 0.48 to 0.56 mm, width 1.04 to 1.12 mm; fuscous, except tip of tylus, bucculae and two longitudinal spots on each side of tylus, black. Carina nearly flat; collum fuscous. Rostrum length 1.92 to 2.00 mm; piceous, reaching hind of middle coxae. **Antennae.** Length of segment I, 0.40 to 0.48 mm; segment II, 0.96 to 1.12 mm; thickened toward apex; segment III, 0.48 mm; segment IV, 0.40 mm; all segments black and covered with short pubescence and longer erect hairs reaching approximately 0.12 mm. **Pronotum.** Length 1.12 to 1.28 mm, anterior angles 0.96 to 1.12 mm, width at base 2.08 to 2.40 mm; black, shiny, punctate. Calli convex, confluent, polished black; posterior margin of disk sometimes slenderly pale; in lighter colored specimens, calli as in *D. schwarzii* (Uhler) and pronotum brown, variously marked with black. Scutellum, convex, fuscous or reddish, inpunctate and shiny. **Hemelytra.** Width 2.40 to 2.88 mm; black, shining and punctate, in light forms, hemelytra brown and marked with black at middle and apex of corium, and
in this case, usually basal half of cuneus white or pale. Membranous brown to blackish, except behind small areole and apical margin of cuneus, paler. **Legs.** Usually black or brownish except basal half of femora reddish. In very light colored specimens, femora scarcely biannulate with pale near apex, tibia distinctly triannulate. **Tarsi** piceous to black. **Claws** piceous, deeply cleft near bases. **Venter.** Piceous to black, shining, pale pubescent. In light colored specimens, first five segments often marked with pale reddish. **Parameres.** Left clasper curved, sensory lobe as long as half of shaft of corpus parameri, gently curved and rounded at its apex, shaft flattened very narrow before apex, apical process short and curved; right relatively large, sensory lobe moderately expanded, narrowing toward apex, apical process curved (Figures 7 and 8). **Phallotheca.** Similar to *D. schwarzii* (Uhler), but differs in the sclerotized flaps around ductus seminis; base of phallotheca dome shaped when viewed dorsally. Maximum length 126 mm, maximum width 0.12 mm (Figure 4). **Vesica.** With four distinct membranous lobes; lobes larger than in *D. schwarzii* (Uhler); four sclerotized spiculi; two spiraled and other others nearly straignt (Figure 6).

**Female:** **Length.** 4.82 to 5.76 mm, width 2.56 to 2.88 mm; very similar to the male in structure and color. Length of segment II of antennae 1.28 mm, slender, thicker at apex. **Sclerotized Rings.** Ring formation similar to *D. schwarzii* (Uhler) but more pointed mesad, and closer to one another; the posterior sclerite larger and longer (Figure 72). **Posterior Wall.** Sclerite pointed dorsally and narrower than in *D. schwarzii* (Uhler), dorsal emargination slightly broader; dorsal membranous part reduced; sclerotized knob on meson very reduced.
Maximum length 0.51 mm; maximum width 0.69 mm (Figure 56).

Fifth Instar Nymphs (Female): Length. 3.36 mm, maximum width 2.16 mm. Body covered with pale hairs and black setae, reaching 0.24 mm. Head. Length 0.72 mm, vertex 0.56 mm; width 0.96 mm; brownish, tylus and middle area of frons, paler. Carina white and slightly convex. Rostrum length 1.44 mm; pale brownish. Antennae. Length of segment I, 0.32 mm; segment II, 0.96 mm; segment III, 0.48 mm. All segments covered with long hairs attaining approximately 0.16 mm. Segment II, slightly thicker on apical one-fourth; segment IV heavily pubescent. Pronotum. Length 0.72 mm, anterior angles 0.88 mm, width at base 1.28 mm; brownish, median line slenderly pale white. Calli slightly convex, marked with brownish median line slenderly pale. Mesonotum and wing pads brownish, median line pale, wing pads reaching fourth abdominal segment. Scutellum brownish, convex, median line indicated with pale. Abdomen. White, usually tinged with reddish; dorsal abdominal gland forming a triangular spot on middle of segment two to four. Each segment dorsally has a pair of dark spots near lateral margins. Venter white, except spiracles and apical segment black. Legs. As in adults, blackish, coxae and basal half of femur paler.

Holotype: Male, June 6, female, May 4, San Diego Co., California, E.P. Van Duzee (USNM).

June 25, 1961, on Cercocarpus ledifolius Nutt., J. Schuh (OSU); 13 Mi.
S. of Lapine, July 8, 1957, G.F. Kraft (OSU). Lake County. Twenty-four
Seventeen Mi. W. Shimnasho, July 26, 1968, on Purshia tridentata
(Pursh.) D.C., J.D. Lattin (OSU); seven Mi. W. Shimnasho, July 2, 1968,
P. Oman (OSU). California. Davis Creek, July 18, 1922, C.L. Fox (CAS);
Mark West Spgs., May 10, 1930, E.P. Van Duzee (CAS); Sequoia National
Pk., 2000 to 5000' elevation, June 2, 1929, E.P. Van Duzee (CAS); Oro-
ville, April 29, 1928, H.H. Kelfer, (CAS); Grass Valley, (CAS), eight
Mi. S., May 18, 1930, E.P. Van Duzee(CAS); Bear River, Tuolomne Co.,
May 17, 1930, E.P. Van Duzee (CAS); Los Angeles Co., and Santa Clara
Van Dyke (CAS); Bergson, May 18, 1920, E.P. Van Duzee (CAS); Pasadena,
June 16, 1909, Brinnel (CAS); Hullville, Lake Co., June 18, 1917, F.E.
Blaisdell (CAS). Nevada. Carson City, June 26, 1929, E.P. Van Duzee
(CAS); Washington. Twelve Mi. E. Goldendale, 2550' elevation, Klickitat

Specimens Illustrated: Male, Sams Valley, Medford, July 11, 1968,
P. Oman (OSU); female, July 26, 1968, Wasco Co., J.D. Lattin (OSU).

D. fulgidus Van Duzee shows a remarkable variation in color.

There are two kinds of color variation: the species darkens as it
matures and secondly there seems to be a color polymorphism due to
environmental factors. In this species, the males reach the adult
before the females; the series taken from Klickitat Co., Washington
include 15 female fifth instar nymphs and 13 adult males.

The host plants of D. fulgidus (Van Duzee) in Oregon are
Purshia tridentata (Pursh.), Cercocarpus ledifolius Nutt. and
Arctostaphylos sp. This species has been observed in laboratory feeding on leaves of Ceanothus, and on aphids.

**Deraeocoris rubroclarus** Knight


Calli reddish brown, scutellum pale, impunctate; cuneous reddish, darker at apex; female genitalia distinctive of the species.

**Male:** Length. 5.66 mm. Head. Length 0.64 mm, vertex 0.48 mm, width 1.04 mm; fulvous, median line paler, frons devoid of distinct markings. Carina flat, separated by a groove from collum. Eyes piceous. Rostrum length 2.08 mm; yellowish, apical segment brownish.

**Antennae.** Length of segment I, 0.48 mm, pale yellowish; segment II, 1.60 mm, nearly cylindrical, constricted base, dark brown but narrowly pale near base, densely pubescent and with exserted hairs; segment III, 0.64 mm, segment IV, 0.48 mm, dark brown, pubescent with exserted hairs. **Pronotum.** Length 1.12 mm, anterior angles 0.88 mm, width at base 2.00 mm; reddish brown, finely punctate; posterior margin slenderly pale; calli slightly convex, shiny, dark reddish; anterior angle of pronotum reddish. **Scutellum.** Pale, convex and impunctate. **Hemelytra.** Width 2.40 mm, closely punctate, yellowish brown, translucent; embolium yellowish pale; base of marginal vein reddish, cuneus reddish, darker at apex. Membrane clear with light infuscation. Veins and posterior margin of coryum reddish. **Legs.** Pale yellowish, translucent; apical half of femur marked with reddish. Tibiae darker at apex. Tarsi brownish. Claws not cleft at base. **Venter.** Reddish brown, shiny, pale pubescent. **Parameres and Phallotheca.** Damaged on specimen.
examined. **Vesica.** Region of gonopore, surrounded by sclerotized plate, margin of one plate serrate; membranous distal part of vesica divided into three moderately developed lobes; three sclerotized spicules (Figure 42).

**Female:** Length. 5.92 mm, maximum width 2.72 mm; very similar to the male; more robust and slightly darker in color; geminate markings on frons; segment II of antennae 1.60 mm, pale yellowish, slender, thicker and dark brown at apex, not as densely pubescent as in male. **Sclerotized Rings.** Narrowing lateral; inner margin arcuated dorsally; posterior sclerite running caudad and appearing to be continuous with dorsal labiate plate which is adjacent to anterior margin. Rings widely separated and connected by broad transverse band (Figure 73). **Posterior Wall.** A pair of sclerites connected mesally by a narrow but relatively long band, giving impression of H-shape. Indication of B structures on meson. Sclerites rounded at both dorsal and ventral ends. Dorsal and ventral membranous part reduced (Figure 57).

**Holotype:** Female, Aug. 12, Portland, Oregon, A.A. Nichol (USNM).

**Material Examined:** Oregon - Jackson County. One Mi. S. of Hyatt Reservoir, Aug. 4, 1956, on Abies sp., J. Schuh (OSU). Lincoln County. Grass Mt. 1.5 Mi. below summit 3150', Sept. 18, 1971, J.D. Lattin (OSU).

The male described above, has been compared with the female holotype by Dr. J.D. Lattin, and doubtlessly it corresponds to the male of the species. In Oregon, this species has been collected from Abies sp. Its habit is not known.
Deraecoris Species a

Runs to the group V of Knight (1921), relatively large in size, above 7 mm; similar to D. kennicotti Knight in size, but dorsum only sparsely and finely pubescent; male genital claspers distinctive for the species.

**Male:** Length. 7.60 mm. Head. Length 1.12 mm, vertex 0.64 mm, width 1.28 mm; front of head black, except spots near inner margin of eyes and on vertex; tylus pale yellowish, but transversely on tip and each side of median line on its basal half, black; juga and lorae pale yellowish, marked with blackish or reddish brown; pubescence on tylus, juga and along inner margins of eyes; collum black; rostrum, length 2.72 mm, black, pale at points, if straight, tip would reach upon hind coxae. **Antennae.** Segment I, length 0.64 mm; segment II, 2.08 mm nearly cylindrical, apex scarcely thicker than base, slightly curved; segment III, 0.72 mm, segment IV, 0.54 mm; all segments black, clothed with fine pale pubescence and with exserted hairs (approximately 0.16 mm in length). **Pronotum.** Length 1.60 mm, anterior angles 1.04 mm, width at base 2.64 mm; sparsely and finely pubescent, with deep, black and irregular punctures; yellowish, anterior angles, behind the calli and basal area black; calli convex, black, sparsely pubescent, impunctate; area between calli yellowish; scutellum black, impunctate, sparsely pubescent, basal angles and apex yellowish; pleura and sternum black; ostiolar peritreme white. **Hemelytra.** Width 3.20 mm; pale yellowish, shiny, sparsely pubescent with black, irregular, punctures; spots at base, middle and apical area of corium, at base and apex of claws, and along embolium blackish. Cuneus pale yellowish brown, apical half
half black. Membrane clear, apical half heavily infuscated; veins blackish. **Legs.** Coxae blackish; front and middle femora blackish; hind femora largely pale, blackish at base and apical one-fourth, two rows of distinct spots present on anterior face; tibiae blackish, biannulated with pale; tibia heavier than femora; tarsi blackish, densely pubescent on undersurface; claws piceous, not cleft near bases. **Venter.** Black, finely pubescent. **Parameres.** Similar to species c but much larger in size; left clasper strongly curved; sensory lobe well developed, elongate, rounded at apex, shaft narrowed distally, apical process truncate. Right clasper, elongate, flattened and gently curved dorsoventrally, narrowing toward apex, apical process curved at right angle (Figure 80). **Phallotheca.** Weakly sclerotized; base dome-shaped when viewed dorsally; lateral view, maximum length 1.44 mm, maximum width 0.64 mm. **Vesica.** Gonopore area surrounded by sclerotized flaps with serrate margins; membranous parts consisting of two lobes; four spicules present, three of which are short and one spiraled, suggesting that of species b but much larger in size (Figure 81).

**Female:** **Length.** Approximately 6.00 mm; maximum width 2.88 mm; segment II of antennae length 1.84 mm; similar to the male, but much smaller in size; median line of front marked with pale.

The genitalia of the female has not been studied because the only specimen at hand was teneral. The genitalia of young female adults are hard to distinguish because of incomplete sclerotization.

**Material Examined:** One male and one female from Oregon, Wallowa County, 9 Mi. S. of Enterprise, Hurricane Creek Campground, ex conifer, July 30, 1976, J.D. Lattin (OSU).
Deraeocoris Species b

Runs to the group V of Knight 1921, because scutellum impunctate and claws only slightly cleft; size relatively small; dorsum nearly globrous; distinct from any species of this group by the sensory lobe of its genital clasper.

**Male:** Length 5.12 mm. **Head.** Length 0.72 mm, width 0.96 mm, vertex 0.48 mm; yellowish pale; spots on front, on each side of vertex and along inner margin of eyes, at base, transversely on tip and on either side of middle of tylus, dark brown; juga and lorae marked with reddish; carina flat, pale yellowish except at middle; collum black; eyes pale reddish. **Rostrum.** Length 2.24 mm, tip surpassing posterior margin of hind coxae, pale brownish. **Antennae.** Segment I length, 0.40 mm; brownish; segment II, 1.12 mm, pale brownish, gradually thickening toward apex, pale pubescent especially on apical half and with exserted hairs (approximately 0.08 mm); segment III, 0.48 mm; segment IV, 0.54 mm; last two segments pale brownish, clothed with pale pubescence and with few exserted hairs. **Pronotum.** Length 0.96 mm, width at base 1.84 mm, anterior angles 0.80 mm; disk coarsely punctate, convex reddish brown, except slenderly on lateral and posterior margins, median line, anterior angles and before calli yellowish; calli convex, black, shiny; black arcs extending from lateral angles of calli to anterior margin of pronotum; small depression present on middle of each callus. **Scutellum.** Reddish brown, but basal angles, apex and apical half of median line pale yellowish. **Hemelytra.** Width 2.40 mm; brownish translucent, short pubescence arising from punctures especially on embolium;
spots near apex, at middle and near base of corium, along embolium and at middle of claws yellowish. Cuneus pale yellowish, apex and inner basal angle dark brown. Membrane clear, apical half infuscated; veins dark brown. Legs. Coxae brownish; hind femora, pale yellowish marked with two reddish brown bands on apical one-third; two distinct rows of brownish spots present on anterior surface; tibiae pale yellowish triannulated with red brown at base, and near middle, apices brownish; tarsi brownish; claws slightly cleft near bases. Legs sparsely pubescent, haris more dense on apical half of tibiae. Venter. Piceous, covered with pale erect pubescence. Parameres. Sensory lobe of left clasper conical, shaft flattened, narrow before apex, apical process curved at right angle; right clasper constricted at base, expanded at sensory lobe region, narrowing toward apex, apical process as in left clasper (Figure 82). Phallotheca. Heavily sclerotized; ductus seminis relatively short; base of phallotheca dome-shaped when viewed dorsally; maximum length 0.96 mm; maximum width 0.40 mm (lateral view). Vesica. Gonopore region surrounded by sclerotized plates with serrate margins; membranous parts consist of one lobe with small lateral diverticulum; four spicules present (Figure 83).

Material Examined: Three males from Deschutes County, Oregon, Three Creeks Meadow, near Sisters, Sept. 25, 1976, on Pinus contorta DougI. J.D. Lattin (OSU).

The genital claspers of this species resemble that of Deraeocoris bullatus Knight which belongs to his group IV. However, the species described herein differs from D. bullatus by having the claws only slightly cleft and the general coloration different, especially that of the scutellum.
Deraeocoris species c

Runs to the group V of Knight (1921); claws not cleft and scutellum impunctate; dorsum distinctly hairy; related to Deraeocoris fulvescens Reuter, but distinguished by genital clasper, calli and margin of embolium.

**Male:** Length. 5.76 mm. **Head.** Length 0.64, width 0.54 mm, vertex 0.40 mm; pale yellowish, slightly convex, spots bordering inner margins of eyes on each side of vertex and on each side of median line of front, dark brown to black; tyulus with dark spots on each side of median line of its basal half and at its base, juga and lorae black, tyulus and inner margins of eyes hairy. **Collum** dark brown. **Rostrum** length 1.84 mm, brownish, paler at joints, tip reaching upon middle coxae. **Antennae.** Segment I length, 0.40 mm, dark brown; segment II, 1.28 mm, dark brown, constricted at base, nearly cylindrical, clothed with pale pubescence, length of exserted hairs equal to thickness of segment; segment III, 0.48 mm; segment IV, 0.40 mm; last two segments dark brown, covered with pale pubescence and a few exserted hairs. **Pronotum.** Length 1.12 mm; anterior angles 0.80 mm; width at base 1.92 mm; disk finely punctate, but punctures deeper, coarser near lateral margins, anterior angles and behind calli; disk convex in its posterior area, lateral margins straight, uniformly dark brown to black, except posterior margin narrowly pale, and median line near posterior margin marked with pale. Calli deep black, slightly convex, separated at posterior margins by two deep punctures; area before calli black. **Pronotum** distinctly hairy, longest hairs (0.24 mm) on anterior angles. **Scutellum** black, basal angles, apex and apical half of median
line, pale. Xyphus, pleura and sternum dark brown to blackish. 

**Hemelytra.** Width 2.24 mm; punctate, hairy; brownish with large yellowish spots near apex and base of corium, also on inner side of embolium; lateral margin of hemelytra nearly parallel; cuneus yellowish pale, inner basal angle and apical half dark brown. Membrane pale, apical half infuscated; veins dark brown invading membrane on each side. **Legs.** Brownish (in one specimen almost black), covered with erect hairs; basal half of hind femora pale; tibiae biannulate with pale; tarsi brownish; claws piceous, not cleft. **Venter.** Dark brown to black, shiny, clothed golden erect hairs. **Parameres.** Similar to *D. fulescens* Reuter, but sensory lobes of left clasper more prominent, not as pointed; right clasper expanded on one side narrowing toward apex (Figure 84). **Phallotheca.** As in *Deraeocoris* species a, but smaller in size, maximum width 0.48 mm, maximum length 0.80 mm. **Vesica.** Simple in structure; region of gonopore surrounded by sclerotized flaps with serrate margins; membranous part with only one lobe enclosing four spicules (Figure 85).

**Female:** Length. 4.48 to 5.28 mm, maximum width, 2.08 to 2.56 mm; segment II of antennae 1.28 mm, more tapering than in male, length of exserted hairs twice thickness of segment; pronotum not as convex as male. Female shorter more ovate than male. Coloration similar but usually lighter. **Sclerotized Rings.** Related to *D. ruboclarus* Knight, narrowing lateral, inner lateral margin acruated dorsally, lateral angle slightly curved dorsal; dorsal and ventral labiate plates present; posterior sclerite, running candad appearing continuous with ventral labiate plate; transverse connecting sclerite present (Figure 86). **Posterior Wall.** Pair of A structures, broadly connected mesally,
dorsal emargination of sclerite only slightly concave; ventral emargination, concave at middle; B structure present on ventral margin of A structure; dorsal and ventral membranous parts reduced (Figure 87).


This species has been taken at the same place and on the same host as D. species b. There is no doubt that there are two different species represented; the differences found in the genital claspers, the vesica and the claws are, along with many distinctive characters between these two species, enough to make them morphologically distinct.

The females of this species show variation in size and color. One female taken on Sept. 25, was full of eggs. This indicates that the species likely overwinters in the egg stage.

**Deraeocoris cerachates** Uhler


Moderate size; pale yellowish; dorsum covered with pubescent hairs, arising from punctures; scutellum impunctate and hairy; calli outlined with piceous; sensory lobe of left clasper elongate; vesica with four spicules.
Male: Length. 5.76 mm. Head. Length 0.64 mm; width 0.96 mm, vertex 0.48 mm, pale yellowish marked with brown on each side of vertex, along inner margin of eye, on frons each side of median line, longitudinally on each side of basal half and at base of tylus. Carina not evident, but separated from collum by a groove, collum pale yellowish. Rostrum length 2.24, reaching posterior margin of middle coxae, pale yellowish, piceous at apex. Tylus, inner margin of eyes and margin of carina, pubescent. Antennae. Segment I, length 0.48 mm; basal half infuscated, hair length 0.16 mm; segment II, 1.28 mm, thickening gradually toward apex, infuscated near base and apex, with long hairs (0.16 mm); segment III, 0.64 mm; segment IV, 0.48 mm; last two segments infuscated, pale pubescent and with a few hairs. Pronotum. Length 1.04 mm, width at base 1.92 mm; anterior angles 0.88 mm, pale yellowish, darker at base, median line pale, disk of pronotum distinctly hairy, posterior margin narrowly white, punctures irregular and deep. Calli slightly convex, (pale), posterior margins, postero-lateral angles and inner lateral angles outlined with black, black spot on antero-lateral angle near anterior margin of pronotum. Scutellum convex, impunctate, pubescent, pale, brownish to black on each side of median line. Hemelytra. Width 2.40 mm, pale yellowish; deep and coarse black punctures on corium and claws; hemelytra covered with hairs arising from punctures; apical half of corium and apex of clavus often marked with dark brown on blackish. Cuneus pale, punctate and pubescent, inner basal margin blackish. Membrane nearly clear, slightly infuscated at apex; veins brownish. Legs. Pale, longest hairs of legs may reach 0.24 mm; hind femora marked with two brownish to piceous bands near apex. Tibiae brownish at apex; hind tibiae indistinctly banded with
brownish at middle. Tarsi brownish at base and apex claws deeply puntate. **Venter.** Reddish brown, piceous around spiracles, covered with pubescent hairs. **Parameres.** Left clasper, sensory lobe elongate narrow before apex, shaft flattened terminated with a curved process right clasper, truncate at base, expanded on one side of sensory lobe region, narrowing toward apex, apical process short and curved (Figure 21). **Phallotheca.** Base dome-shaped, moderately sclerotized; ductus seminis surrounded by plates with serrate margins; membranous lobe and spicules apparent. Maximum length 1.04 mm, maximum width 0.60 mm (Figure 33). **Vesica.** Area of secondary gonopore surrounded by plates with serrate margins; membranous lobes with three diverticula and four sclerotized spicules (Figure 43).

**Female:** **Length.** 5.93 mm; width 2.72 mm; similar to general aspect to male. Antennal segment II, length 1.44 mm, pale at middle, yellowish brown at base and apex; venter paler than in the male. **Sclerotized Rings.** Narrowing lateral as in *D. rubroclarus* Knight, but inner margin less arcuated, lateral angle slightly curved dorsal; adjacent sclerotization, dorsal and ventral labiate plates present, posterior sclerite, apparently continuous with ventral labiate plates. Rings not as widely separated as in *D. rubroclarus* Knight (Figure 74). **Posterior Wall.** One pair of A structures connected by a narrow band mesally, sclerites rounded at their dorsal apices, dorsal emargination broad and shallow; ventral and dorsal membranous parts present; indication of sclerotized knob on B structure on meson. Maximum width 0.69 mm, maximum length 0.45 mm (Figure 58).

**Holotype:** Female, San Jose del Cabo, Lower California, Uhler (CAS No. 15).
Material Examined: **Oregon - Benton County.** Lobster Valley, July 23, 1977, on *Alnus rubra* Bong., J.D. Lattin (OSU). **Klamath County.** Sand Creek, July 31, 1956, on *Alnus* sp., J. Schuh (OSU). **California.** Los Angeles, Sept. 8, J.C. Bradley (CAS); Mill Creek Cn., San Bernardino Co., Aug. 9, 1923, E.P. Van Duzee (CAS); San Diego Co., June 8, 1913, E.P. Van Duzee (CAS); Sobaba Spgs., Riverside Co., June 2, 1917, E.P. Van Duzee (CAS).

The specimens described above have been compared with Uhler's type. They are smaller in size and have a more pronounced coloration, but to the writer, they agree in the overall characteristics to Uhler's type.

In Oregon, this species has been collected from *Alnus* sp.

*Deraeocoris fenestratus* (Van Duzee)


Dorsum hairy, reddish brown with piceous or black; calli flat and black, with arc extending from antero-lateral angle to anterior margin of pronotum; frons and vertex without black markings; sensory lobe of left clasper similar to *D. cerachates* Uhler but more slender.

Male: Length. 5.26 mm. Head. Length 0.72 mm, width 0.96 mm, vertex 0.48 mm, reddish brown; pubescent hairs along inner margin of eyes, on loriae, juga and apical half of tylus; piceous spots behind antennae, on larva and juga, longitudinally on each side and at base of tylus. Carina flat, separated by a groove from collum; eyes piceous. Rostrum, length 2.40 mm; basal half yellowish, apical half brownish to
piceous, tip of rostrum reaching upon hind coxae. Antennae. Segment I, length 0.48 mm, yellowish with a few pale hairs; segment II, 1.60 mm, thickening toward apex, yellowish, apical one-fourth densely pubescent and piceous, erected hairs reaching 0.24 mm; segment III, 0.54 mm; segment IV, 0.48 mm; yellowish piceous at apex, pubescent and with erected hairs. Pronotum. Length 1.21 mm anterior angles 0.96 mm, width at base 2.08 mm, disk hairy, with deep black punctures, yellowish to reddish brown becoming piceous near basal margin; posterior margin of disk slenderly white; calli flat, black, polished, black to piceous arc extending from antero-lateral angles to anterior margin of pronotum; sometimes reddish or pale spot present inside calli; ventral side of thorax yellowish to reddish. Scutellum piceous, median line and basal angles pale yellowish. Hemelytra. Width 2.56 mm, hairy, irregularly black punctate; reddish with black or piceous spots near apical margin at middle and at base of corium; embolium pale opaque, except outer margin and apical area piceous or black; cuneus pale opaque, inner basal angle and apex piceous. Membrane slightly infuscated, paler behind apex of cuneus; veins dark brownish, invading on membrane. Legs. Pale yellowish or brownish, length of hairs on tibiae 0.24 mm; coxae pale yellowish; femora biannulate with reddish brown on apical half; tibiae triannulate with brown at apex, middle and base; apical segment of tarsi brown; claws piceous, deeply cleft near base. Parameres. Similar to D. cerachates Uhler, but sensory lobe of left clasper more slender and slightly curved, narrowed apical end longer; right clasper slightly expanded on both sides of sensory lobe region, apical process curved (Figure 22). Phallotheca. As in D. cerachates, but capitate process larger and spicules longer (Figure 34). Vesica.
Gonopore region surrounded by sclerotized plates, but their margins are not as conspicuously serrate as in *D. cerachates*; two membranous lobes and six spicules.

Female: Length. 5.92 mm, maximum width 2.88 mm; segment II of antennae length, 1.60 mm. Very similar to the male, although slightly larger in size. Sclerotized Rings. Narrowing lateral as in *D. cerachates* Uhler, posterior margin thickened; lateral angle curved caudad; posterior sclerite appears to be continuous with anterior margin which curves caudad after lateral angle of ring, adjacent sclerotization present (Figure 75). Posterior Wall. Same general features as in *D. cerachates* but dorsal extension of sclerites pointed at apex; dorsal emargination deeper and narrower; ventral extension of sclerites short; sclerotized bands present on meson. Dorsal and ventral membranous parts present. Maximum length 0.51 mm, maximum width 0.54 mm (Figure 59).


In Oregon this species has been taken from Arctostaphylos sp. Its biology is not known.
Deraeocoris fusifrons Knight


Very similar in general appearance to D. fenestratus Van Duzee; background color pale or yellowish; may be distinguished by sensory lobe of left clasper, form of right clasper, vesica, and posterior wall of bursa copulatrix (Figures 24, 45 and 60).

Male: Length. 5.08 mm. Head. Length 0.80 mm, vertex 0.48 mm; width 1.04 mm; head pale to reddish, marked with black or brownish in light specimens on each side of basal half, narrowly on tip and at base of tylus, on frons each side of median line, on lateral side of vertex and along inner margins of eye. Carina flat, separated by a groove from collum. Eyes piceous. Rostrum, length 1.92 mm, pale yellowish, translucent, apical half darker and apex piceous, tip reaching hind margins of mesocoxae. Antennae. Segment I, length 0.64 mm, pale yellowish and translucent; with sparse hairs; segment II, 1.44 mm, pale yellowish apex dark brown and thicker, pubescent on apical half; exserted hairs reaching 0.24 mm; segment III, 0.54 mm, and segment IV, 0.40 mm, pale yellowish, with short pubescence and sparse long hairs. Pronotum. Length 1.04 mm, anterior angles 0.96 mm, width at base 2.08 mm, yellowish pale, basal half on each side of median line black; some specimens have the pronotum entirely black; disk irregularly punctate and hairy. Calli, solid black, confluent, slightly convex; posterior margin of disk slenderly pale. Scutellum, pale, black on each side of median line. Hemelytra. Width 2.64 mm, pale yellowish with black markings at base, middle and apical region of corium, on claws;
hemelytra punctate and covered with long pubescent hairs. Cuneus pale, punctate and pubescent, narrowly on basal margin and apical half black or dark brown. Membrane, lightly infuscated, pale behind apical half of cuneus; veins dark brown. Legs. Pale yellowish, hind femora, with two dark reddish bands on apical half and anterior surface; tibiae marked with light brown at middle and apex. Tarsi pale brownish; claws deeply notched. Venter. Reddish brown, shining; pubescent; spiracles marked with piceous. Parameres. Very similar to D. fenestratus Van Duzee but sensory lobe of left clasper slightly shorter, lateral margin nearly straight when viewed dorsally. Inner margin of right clasper sinuate (Figure 24). Phallotheca. Same features as in D. fenestratus Van Duzee. Vesica. Similar to D. fenestratus, but membranous part having four distinct lobes, and spiculi shorter (Figure 45).

Female: Length. 5.08 mm, maximum width 2.96 mm; segment II of antennae 1.52 mm, very similar to the male in coloration and structure. Sclerotized Rings. Very similar to D. fenestratus, but margin of rings and posterior sclerites more slender, shape of dorsal and ventral labiate plate showing some differences (Figure 76). Posterior Wall. Lobes of interramal sclerites as in D. cerachates, but dorsal emargination slightly deeper and narrower; ventral emargination of sclerites serrate; sclerotized knob present on ventral margin of meson or mesal connection. Ventral membranous parts forming two pointed lobes (Figure 60).

Holotype: Male, Santa Clara Co., California, May (Coleman) (USNM).

The specimens described above, are smaller than the ones described by Knight (1921), but the female genitalia were found identical to that of a specimen determined by Knight himself, as D. fusifrons. This species has been collected from Lithocarpus densiflora (Hook. and Arn.) Retd. and Adenostema sp.

A population, closely related to D. fusifrons Knight, has been collected in Corvallis by Dr. J.D. Lattin, from Quercus garryana. The external aspect of these specimens is very similar, if not identical to D. fusifrons Knight. The writer has not been able to find any significant differences in the male genitalia. However, the female genitalia are significantly different from that of D. fusifrons. The sclerotized rings (Figure 77) are similar to that of D. fusifrons, but the lateral angle of each ring is rounded. Moreover, the inner lateral margin of the ring is strongly arcuated dorsally. The posterior wall shows also noticeable differences: the mesal connection is slightly longer; the sclerotized knob is adjacent to the posterior margin of this mesal connection; the ventral emargination of the sclerite is smooth and not serrate.

Additional information and collection are needed for determining the status or identity of these specimens.
GENUS DERAEOCAPSUS KNIGHT


Type Species: Deraeocoris ingens Van Duzee, 1961 (fixed by Knight, Rept. Minn. St. Ent. 18:198, 1921).

Structurally, this genus has all the features of Deraeocoris Kirschbaum. Its distinctive characters are as follows:

Size relatively large, 7-8 mm; claws not cleft near bases; second antennal segment strongly clavate; metatarsus thicker than segment II and III, greater in length than segment II. Right clasper relatively larger than in most species of Deraeocoris (Figure 23); vesica characterized by two tubular membranous lobes and a paddle-shaped spiculum (Figures 46 and 47); sclerotized rings forming a figure 8 when viewed dorsally (Figures 62 and 63); posterior wall of bursa copulatrix as in Figures 78 and 79.

Deraeocapsus Knight is a small genus, consisting only of two species and known from California, Oregon, British Columbia and probably Washington. It does not differ much from Deraeocoris. The external morphology and genital structure suggest a close relationship with Deraeocoris. Investigating the male genitalia, Kelton (1959) stated:
"...the difference in the genitalia are less pronounced between these two genera than among the species of the genus Deraeocoris." However, the differences found in the sclerotized rings and the posterior wall of the bursa copulatrix, to the writer, can justify two separate genera.

The genus Strobilocapsus Bliven (1956), according to his description, is the same as Deraeocapsus Knight.

Little is known about the biology of the species of Deraeocapsus. The most important literature includes the original description by Van Duzee (1916) and Knight (1921) and the description of the male genitalia of _D. ingens_ by Kelton (1959).

**Key to the Species of Deraeocapsus**

Dorsum distinctly hairy; segment II of antennae gradually thickened toward apex; long hairs on tibiae and antennal segment II reaching 0.24 mm; without distinct spines on anterior face of hind tibiae .................. _ingens_ (Van Duzee)

Dorsum glabrous or only with sparse pubescence; segment II of antennae strongly clavate for apical one-third. Hairs on tibiae and antennae stiffer and shorter; distinct spines on anterior face of tibiae ............... _fraternus_ (Van Duzee)

_Deraeocapsus ingens_ (Van Duzee)


Relatively large-sized species, 7.5 to 8 mm, dorsum black, hairy; second antennal segment clavate, covered with dense hairs.

**Male:** Length. 7.44 mm. Head. Length 1.12 mm; width 1.60 mm; vertex 0.80 mm; similar to most species of Deraeocoris; dark brown to black; front of head slightly convex; carina and inner angles of eyes slenderly pale, but median line of carina black; collum black; eyes piceous. Rostrum length 2.88 mm; black, tip reaching posterior margin of mexocoxae. Antennae. Segment I, length 0.72 mm, dark brown, clothed with long hairs; segment II, 2.64 mm, gradually thickening toward apex, dark brown; with dense hairs (0.24 mm); segment III, 0.64 mm; segment IV, 0.64 mm. Pronotum. Length 1.60 mm; width anterior angles 1.12 mm; width at base 2.56 mm; black, punctate and distinctly hairy, hairs on pronotum reaching 0.24 mm; calli nearly flat, black, polished; suctellum, black, more finely punctate than disk of pronotum. Hairs on pronotum reaching 0.24 mm in length. Hemelytra. Width 3.20 mm, black, shiny, coarsely punctate, covered with hairs at least on lateral margins, hairs as on pronotum; cuneus black punctate; membrane uniformly brownish, veins darker. Legs. Uniformly dark colored; hairs on tibiae longer and denser than in D. fraternus; no distinct spines on anterior surface of all tibiae; claws not cleft near base. Venter. Black, shiny and finely pubescent. Parameres. Left clasper similar to Deraeocoris piceicola, sensory lobe conical; shaft flattened, relatively broad, narrowed before apex, short apical process. Right clasper, larger in size than most of Deraeocoris, edges nearly parallel, with a short and curved process at apex (Figure 23). Phallotheca. Same structure as in Deraeocoris; ductus seminis as in the subgenus Camptobrochis, looped before entering vesica; base of phallotheca
conical but rounded when viewed dorsally (Figure 82). **Vesica.** Region of gonopore surrounded by sclerotized plates; membranous parts consisting of two large membranous tubular lobes and four smaller diverticules two of which are ending with sclerotized process; spiculum, paddle-shaped, rounded at apex (Figure 47).

**Female:** **Length.** 7.52 mm; maximum width 3.52 mm; segment II of antennae length, 2.96 mm; similar to male. **Sclerotized Rings.** Margins of ring forming a narrow figure 8 when viewed dorsally; margins fused posteriorly into a common piece curving mesad, posterior sclerite attached to posterior half of lateral margin of ring and the above common piece; adjacent sclerotization present (Figure 79). **Posterior Wall.** One pair of A structures; broadly connected mesally; dorsal lobe of A structures pointed and curved; dorsal emargination broad and shallow; dorsal margin curved; ventral emargination of sclerite concave; sclerotized knob adjacent to ventral margin; dorsal membranous part reduced (Figure 63).

**Holotype:** Mt. Tallac above Alpine Creek, California, July, E.P. Van Duzee (CAS).

**Specimens Examined:** **Oregon - Jackson County.** Butte Falls, June 7, 1941, J. Schuh and Gray (OSU). **California.** Huntington Lake, 7000' elevation, Fresno Co., July 24, 1919, E.P. Van Duzee (CAS); Gold Lake, Sierra Co., June 20, 1934, L.S. Rose (CAS); Shasta Spgs., June 11, 1920, C.L. Fox (CAS); Cayton, Shasta Co., July 13, 1913, E.P. Van Duzee (CAS).

The host plant of this species is not known in Oregon. In the original description, Van Duzee (1916) mentioned that the types were collected from Jeffrey pine (*Pinus jeffreyi* Grev. and Balf.).
Deraeocapsus fraternus (Van Duzee)


Very similar to D. ingens; smaller in size; dorsum not as distinctly hairy as in D. ingens; second antennal segment more clavate; tibiae with distinct rows of spines; posterior wall of bursa copulatrix distinctive for the species (Figure 62).

Male: Length. 6.56 mm. Head. Length 0.88 mm, vertex 0.80 mm, width 1.44 mm. Black, vertex flat, narrowly pale; posterior margin of eyes narrowly pale, collum black. Rostrum length 2.40 mm; tip apparently reaching posterior margin of mesocoxae. Antennae. Segment I, length 0.64 mm piceous; segment II, 2.72 mm, strongly clavate, apical third twice as thick as basal half, pale reddish but apical one-third darker; hairs on first and second segments are stiffer and shorter than D. ingens; segment III, 0.64 mm; segment IV, 0.64 mm; last two segments dark with pale pubescence and a few exserted hairs. Pronotum. Length 1.36 mm, anterior angles 1.17 mm, width at base 2.24 mm, disk of pronotum black, deeply punctate, shiny; calli nearly flat, black, polished; disk glabrous or with a few hairs, but not as distinctly hairy as in D. ingens; scutellum black, punctate. Hemelytra. Width 2.88 mm, black, punctate, glabrous or nearly so; cuneus black, punctate; membrane infuscated; veins dark brown. Legs. Pale reddish; coxae dark
brown; femora not as hairy as in *D. ingens*; tibiae hairy and with
distinct rows of spines, tarsi black, pale pubescent; claws not
cleft, piceous. **Parameres and Phallotheca.** Similar to *D. ingens*.
**Vesica.** Same features as in *D. ingens*, but spiculum slightly different;
shape of tubular membranous lobes, when fully inflated, also different
(Figure 42).

**Female:** **Length.** 6.72 mm, maximum width 3.04 mm; segment II of
antennae length, 3.04; very similar to the male in color and structure.
**Sclerotized Rings.** Similar to *D. ingens*; rings more laterally produced;
margin of ring more slender; dorsal and ventral labiate plates larger
at apices (Figure 78). **Posterior Wall.** Similar to *D. ingens*, but dor-
sal indentation of A structures longer, dorsal emargination of sclerite
deeper; ventral emargination truncate; dorsal membranous part absent;
ventral membranous part very reduced; indication of B structure on meson
but not as well marked as in *D. ingens*. Maximum length 0.86 mm; maxi-
imum width 1.04 mm.

**Holotype:** Mt. Tallac, above Alpine Creek, California, July,
E.P. Van Duzee (CAS).

**Specimens Examined:** Oregon - Deschutes County. One Mi. N.
Indian Ford Campground. June 24, 1972, on *Pinus ponderosa* Dougl.,
J.D. Lattin (OSU). Three Creeks Meadow, near Sisters, Sept. 1, 1977,
on *Pinus contorta* Dougl. J.D. Lattin (OSU). Hood River County. Mt.
Hood 3000 to 6000' elevation, July 26, 1927, E.P. Van Duzee (CAS).
Klamath County. Klamath Falls, June 26, 1959, J. Schuh (OSU); 17 Mi.
W. of Chemult, July 25, 1955, G.R. Ferguson (OSU); Long Creek, 12 Mi.
N.E. Bly, July 16, 1958, J.D. Vertrees (OSU). **Lane County.** Frog Camp,
E. of Rainbow, Aug. 1, 1959, on *Pinus albicaulis* Englem., J.D. Lattin

This species has been reported from British Columbia by Scudder (1961); its range apparently extends farther north than D. ingens.

The species, Strobilocapsus annulatus described by Bliven (1956) based on his description alone, seems to the writer to be the same as D. fraternus (Van Duzee).

The host plants of D. fraternus in Oregon include three species of pines: Pinus contorta Dougl., P. ponderosa Douglas and P. albicaulis Englem.
CONCLUSIONS

Fourteen species of Deraeocoris Kirschbaum, two species of Deraeocapsus Knight and three unknown species of Deraeocoris are known at present to occur in Oregon. Most species have a characteristic geographical distribution pattern, which usually coincides with the host plant distribution. Some species are restricted to one or very few species of plants while others have several host plant species. It is not known whether this fact reflects a direct relationship to prey preference or to the partial phytophagy observed in some species.

The genital structures of both males and females constitute useful characters for separating species of these genera; since many species of Deraeocoris are difficult to distinguish on their external morphology alone. Those portions of the genitalia that were investigated, including parameres, vesica, sclerotized rings and posterior wall of the bursa copulatrix appeared to be fairly stable. The intraspecific variation found in the genitalia consisted of differences in sclerotization due chiefly to difference in age of the specimens. The female genitalia often showed greater variation, whereas the male genitalia showed only slight differences between closely related species.

Based on the overall similarities of the parts of the genital structures mentioned above, and the phallotheca, the species of Deraeocoris of Oregon may be clustered into two main groups. The first group includes Deraeocoris bakeri Knight, D. brevis (Uhler), D. validus (Reuter), D. incertus Knight and D. rufusculus Knight. The second group contains the remaining species. These groups may be divided further by considering each part of the genitalia separately. The
species of the genus *Deraeocapsus* Knight are closely related to *Deraeocoris*. However, the sclerotized rings are distinct in *Deraeocapsus*.

*Deraeocoris brevis piceatus* Knight is considered only as a color morph and is suppressed as a subspecies.

In Oregon, *Deraeocoris brevis* (Uhler) and *D. fasciolus* Knight may be considered of some importance in the control of small arthropods of orchard trees.
SUMMARY

1. The literature concerning the genera Deraeocoris Kirschbaum, Deraeocapsus Knight and the systematic position of the tribe Deraeocor-\textit{nii} Douglas and Scott was presented.

2. The morphology of the male and female genitalia of these two genera was discussed in detail with emphasis on the phallotheca, the parameres and the vesica for the male genitalia and on the sclerotized rings and the posterior wall of the bursa copulatrix for the female genitalia.

3. The following species were studied: \textit{Deraeocoris bakeri} Knight, \textit{D. brevis} (Uhler), \textit{D. validus} (Reuter), \textit{D. incertus} Knight, \textit{D. rufusculus} Knight, \textit{D. piceicola} Knight, \textit{D. fasciolus} Knight, \textit{D. shastan} Knight, \textit{D. schwarzi} (Uhler), \textit{D. fulgidus} (Van Duzee), \textit{D. rubroclarus} Knight, \textit{D. cerachates} Uhler, \textit{D. fenestratus} (Van Duzee), \textit{D. fusifrons} Knight, \textit{Deraeocapsus ingens} (Van Duzee) and \textit{D. fraternus} (Van Duzee). Three unknown species named a, b and c also were described. For each species, a description or re-description of the external morphology, detailed description of the male and female genitalia, list of the localities and host plants of the materials examined, were given.

4. Based on the genital structures, the relationships between the different species are summarized as follows:

The phallotheca did not show much intraspecific variation. However, based on the relative length of the ductus seminis, the species of \textit{Deraeocoris} of Oregon may be divided into two groups. The first group has the ductus seminis forming a loop before entering the vesica and includes: \textit{Deraeocoris bakeri} Knight, \textit{D. brevis} (Uhler), \textit{D. validus}
(Reuter), D. incertus Knight and D. rufusculus Knight. The second group, has the ductus seminis curving at a right angle before entering the vesica and includes the remaining species. The species of the genus Deraeocapsus are related to the first group on the basis of the ductus seminis.

The parameres or claspers showed interspecific variation, particularly with regard to the size and shape of the sensory lobe of the left clasper and the shape and the relative size of the right clasper compared to the left clasper. The two groups cited above may be recognized on the basis of the nature of the apical process of the left claspers. The apical process consists of a simple point in the first group, while it is more or less curved in the second group. The species of the genus Deraeocapsus have a curved apical process.

When fully inflated, the vesica showed great variation between species in the shape, size and number of the membranous lobes and sclerotized spicules. The sclerotized flap-like structures surrounding the secondary gonopore may be reduced or well-developed. In the first group cited above, these structures were very reduced. They were well developed in the second group. The second group may be further divided, depending on whether the margins of these structures are serrate or simple. The species of Deraeocapsus have sclerotized flap-like structures with small margins.

The sclerotized rings are highly variable in the size and shape of the rings themselves and in the adjacent sclerotizations. The same two groups may be distinguished based on the general appearance of the rings. In the first group, the rings are narrow mesally. They are narrowed laterally in the second group. The species of Deraeocapsus
have a different ring structure, although the general structure suggests a close relation to species of the genus Deraeocoris.

The posterior wall of the bursa copulatrix, although quite simple in structure, showed a high degree of variation between species. The A structures or interramal sclerites have various sizes and shapes. They may be narrowly or broadly connected mesally. The species of Deraeocoris of Oregon may be divided into two groups as above, based on the absence or presence of a small sclerotized knob or B structure on the mesal connection or meson. In the first group there is no indication of a sclerotized knob on meson and in the second group, the sclerotized knob is either indicated or present.
BIBLIOGRAPHY


Figure


3. *D. fulgidus* (Van Duzee). Dorsal view of gonocoxite with top removed. BF., basal foramen; BP, basal plates; DS, ductus seminis; LC1g, left clasper; PC, capitate process; PGp, primary gonopore; Ph, phallotheca; RC1, right clasper; Spi, spicule; Ves, vesica.

4. *D. fulgidus* (Van Duzee). Lateral view of phallotheca. BP, basal plate; BPh, base of phallotheca; CX, connexiva; DS, ductus seminis; PC, capitate process; PGp, primary gonopore; Ph, phallotheca; SGp, secondary gonopore; Spi, spicule.

5. *D. fulgidus* (Van Duzee). Dorsal view of base of phallotheca. BF, basal foramen; BP, basal plate; PGp, primary gonopore; PT, "ponticularis transversalis."


8. *D. fulgidus* (Van Duzee). Right clasper. AP, apophyse; BPr, basis parameri; CPr, corpus parameri; SL, sensory lobe.
Plate II

Figure

9. *Deraeocoris fulgidus* (Van Duzee). Lateral view of female abdomen. Cux, covnexiva; Ptg, paratergite; Sp, spinacle; 2 V1, second valvulae; 3 V1, third valvulae; 2 Vlf, second valvifers.

10. *D. fulgidus* (Van Duzee). Dorsal view of female genitalia. OC, common oviduct; OL, lateral oviduct; 1 Ra, first rami; 2 Ra, second rami; RP, ramal plate; SD, seminal depository; SG, spermathecal gland; SR, sclerotized rings; 1 V1, first valvulae; 2 V1, second valvulae; 3 V1, third valvulae; 2 Vlf, second valvifers.

11. *D. fulgidus* (Van Duzee). Ventral view of female abdomen. Sgp, subgenital plate; Sp, spicule; 1 V1, first valvulae, 2 V1, second valvulae; 3 V1, third valvulae; 2 Vlf, second valvifers.

12. *D. fulgidus* (Van Duzee). First valvulae. 1 Ra, first rami.

Figure

14. *Deraeocoris bakeri* Knight. Parameres. (a, dorsal view of left clasper; b, lateral view of left clasper; c, dorsal view of right clasper).


17'. *D. rufusculus* Knight. Parameres.


Figure

22. *D. fenestratus* (Van Duzee). Parameres. (a, dorsal view of left clasper; b, lateral view of left clasper; c, dorsal view of right clasper).


27. *D. incertus* Knight. Lateral view of phallotheca.


Plate V

Figure

34. *D. fenestratus* (Van Duzee). Lateral view of phallotheca.
40. *D. fasciolus* Knight. Ventral view of vesica.
42. *D. rubroclarus* Knight. Ventral view of vesica.
43. *D. cerachates* Uhler. Ventral view of vesica.
44. *D. fenestratus* (Van Duzee). Ventral view of vesica.
45. *D. fusifrons* Knight. Ventral view of vesica.
47. *Deraeocapsus ingens* (Van Duzee). Ventral view of vesica.
Plate VI

Figure


52. *D. rufusculus* Knight. Posterior wall.


55. *D. schwarzii* (Uhler). Posterior wall.


Figure

60. D. fusifrons Knight. Posterior wall.
63. Deraeocapsus ingens (Van Duzee). Posterior wall.
64. Deraeocoris bakeri Knight. Sclerotized rings.
Figure

68. *Deraeocoris rufusculus* Knight. Sclerotized rings.
69. *D. fasciolus* Knight. Sclerotized rings.
70. *D. piceicola* Knight. Sclerotized rings.
73. *D. rubroclarus* Knight. Sclerotized rings.
74. *D. cerachates* Uhler. Sclerotized rings.
76. *D. fusifrons* Knight. Sclerotized rings.
77. *D. fusifrons*. Sclerotized rings.
78. *Deraeocapsus fraternus* (Van Duzee). Sclerotized rings.
Plate IX

Figure

80. *Deraeocoris* species a. Parameres. (A, dorsal view of left clasper; b, lateral view of left clasper; c, right clasper).


82. *Deraeocoris* species b. Parameres.


84. *Deraeocoris* species c. Parameres.


86. *Deraeocoris* species c. Sclerotized rings.
