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**A SYNOPSIS OF THE NEARCTIC CHRYSOPIDAE WITH A KEY TO THE
GENERA**

(NEUROPTERA)¹

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The chrysopid fauna of North America has not been treated in a comprehensive way since the revision of Banks (1903). During the ensuing 47 years he published numerous papers in which he described 47 new species and erected two new genera. Smith (1922) made important contributions to knowledge of the biology of these insects and also added valuable information concerning the morphology and taxonomy of the larvae. Further studies by Smith adequately treated the species known to occur in Kansas (1925 and 1934) and in Canada (1932), while Froeschner (1947) dealt with the species of Missouri. Although these papers contain valuable keys to the genera and species of their respective regions, they are quite inadequate if one is dealing with forms from areas other than those for which the keys are intended. This is particularly true for specimens from the western United States which can be identified only by reference to many scattered publications.

Dr. Frank M. Carpenter and Mr. Phillip A. Adams (personal communication) propose to make the thorough revision of the family which is badly needed. Such a study requires analysis of the taxonomic characters now in use as well as basic morphological work to select new characters so that generic relationships will be clarified and species evaluated.

A revisionary study is greatly complicated, especially on the generic level, by the work of Longinos Navas, who failed to integrate newly described forms with previously established groups. To evaluate most genera which occur in North America it will be necessary to have a thorough knowledge of the numerous neotropical species which Navas has referred to these genera. Dr. Roger C. Smith studied many of these Navasian types in European museums and made notes on these specimens. He concluded that the evaluation and consolidation of the Navasian species from the New World is an overwhelming task involving "thankless and uninteresting . . . drudgery."

This paper is in the nature of an interim review of the family as it occurs in the Nearctic region north of Mexico. It is intended to facilitate determinations until such time as a thorough revision is

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available. It is hoped that the present work will provide a means for recognition of genera and major species groups since, as pointed out previously, existing keys are inadequate. For specific determinations reference is made to the appropriate sources.

The synonymy of included species is believed to be comprehensive in the sense that all of the contributions which have affected the names of Nearctic species are listed.

Information on geographical distribution is not intended to be complete and is usually stated in general terms. For the sake of brevity distributional records obtained from the literature are not always credited to individual sources. In addition to the numerous papers by Banks (See Carpenter and Darlington, 1954), most records have been taken from the following: Bickley (1941), Brimley (1938), Froeschner (1947), Leonard (1926), Montgomery and Trippel (1933), Parfin (1952), and Smith (1922, 1932, and 1934). New records are based on material seen by one or both of the authors. It is hoped that the inclusion of these distributional records will serve as an aid in the determination of certain species.

The history of the family Chrysopidae begins with Leach who in 1815 established the genus *Chrysopa* for those lacewings in which the antennae are filiform, as contrasted to members of the restricted Linnaean genus *Hemerobius* in which the antennae are moniliform. For these two genera Leach erected the family Hemerobida. Schneider (1851) in his monograph of the species of the world designated the green lacewings as the division Chrysopina of his family Hemerobidae, and Hagen (1866) raised the group to the rank of subfamily with *Chrysopa* as the type genus. The present status as a family was the result of McLachlan's revision of 1868.

For many years it was assumed that the type species of *Chrysopa* had been subsequently designated as *Hemerobius perla* Linné by either Westwood in 1840 (Morse, 1931) or by Banks in 1903 (Smith, 1932). Unfortunately *Hemerobius perla* Linné had been selected by Latreille in 1810 to serve as the type species of the genus *Hemerobius* and this selection was upheld by the International Commission in 1910 (Opinion 11). A strict adherence to the International Rules in this case would have transferred the name *Hemerobius* to the genus *Chrysopa* and would have necessitated a new name for the genus formerly known as *Hemerobius*. In addition, since both of these genera are now the types of their respective families, this shift of names could have resulted in the renaming of the families. Indeed Banks (1945, 1948) began to use the name Nothochrysidae in place of Chrysopidae. A recent decision of the International Commission (Opinion 211, 1954) has prevented this confusion by a suspension of the rules. All previous designations of type species for these two genera were set aside, and *Hemerobius perla* Linné, 1758, was designated as the type of *Chrysopa* Leach, 1815.

Prior to the middle of the nineteenth century, all Nearctic species were referred to the genus *Chrysopa*. Fitch (1856) erected the genus

Meleoma and described *M. signoretti*—a species in which the males have a tubercle between the bases of the antennae—*signoretti* becoming the type species by monotypy. McLachlan (1868) described the genera *Nothochrysa* and *Leucochrysa* with *C. fulviceps* Stephens and *C. varia* Schneider respectively as the type species. Although these genera were based on Palaearctic and Neotropical forms several Nearctic species have subsequently been assigned to these genera. In the same paper McLachlan also called attention to certain features of the wing venation which have since been rather extensively used by numerous other workers. Banks (1903) in his revision of the family recognized the four existing genera and added *Allochrysa* and *Eremochrysa*, designating *C. virginica* Fitch and *C. punctinervis* McLachlan respectively as the type species. In addition to keys to the existing genera and species, numerous forms were placed in synonymy. Subsequently Banks (1911) erected the genus *Chrysopiella* with *Chrysopa sabulosa* Banks as the type and (1938a) the genus *Abachrysa* with *Chrysopa eureka* Banks as the type.

Considerable confusion regarding the limits and validity of three genera has arisen as a result of the publications of Navas (1916, 1917 et seq.). *Nodita ramosi* and *Nodita melanocera* (both from Brazil) were described by Navas (1916), yet a description of the genus *Nodita* was not published until the following year. *Chrysopa intermedia* Schneider was designated by Navas (1917) as the type species of the genus *Nodita*, and two Nearctic species which had formerly been placed in *Leucochrysa* were referred to this genus. Navas (1917) also synonymized the genus *Allochrysa* Banks with *Leucochrysa* McLachlan, but this synonymy has not been recognized by any American worker. Banks (1939) placed the rest of our species of *Leucochrysa* in *Nodita*, so that *Leucochrysa* as it is now conceived is restricted to tropical America but is not necessarily congeneric with *Nodita* as was implied by Smith (1934).

EXPLANATION OF TAXONOMIC CHARACTERS

Descriptions of Nearctic species have relied heavily on the pigmentation of the body. To a lesser extent, the shape of the wings, degree of blackening of the wing veins and overall size have been used. Recent work has begun to stress the importance of more fundamental characters. Smith (1932) reported on preliminary genitalic studies, and Killington (1937) figured the male genitalia of many of the British species. Principi (1949) made a valuable study of the male and female reproductive systems of the Palaearctic species, *Chrysopa septempunctata* Wesm. and *C. formosa* Brauer, and assembled much pertinent information. Bickley (1952) studied the genetic basis of the pigmentation of the head of *Chrysopa oculata* Say. Future taxonomic studies of the Nearctic species will require a re-evaluation of specific relationships from the standpoint of internal anatomy as well as a consideration of the patterns of geographic distribution, ecology, and cytogenetics.

The generic classification has employed such characters as the relative length of the antennae, the presence or absence of an interantennal tubercle, darkening of the pterostigma, and the venation of the wings, particularly the basal course of the branches of the media. Venation in the family Chrysopidae is extremely specialized because of the extensive coalescence of many of the veins, and interpretations of the condition found in the adult wing have been possible only after a study of the tracheation of the developing pupal wings. McClendon (1906) interpreted the important veins correctly, and a more intensive analysis was undertaken by Tillyard (1916), Comstock (1918), and Smith (1922). Morse (1931) summarized previous work. It has recently become apparent that the venation of the Neuroptera is more complex than had been supposed. The primitive, four-branched structure of the media which is given by Comstock (1918) has been shown by recent work to be a more specialized condition, and the truly primitive wing had an anterior bifurcate vein attached to the medial stem. This vein has been termed the Anterior Media (MA) by Lameere (1922), while the remainder of the media (the entire media of Comstock's terminology) is referred to as the Posterior Media (MP). Although absent in many of the higher orders, Carpenter (1936, 1940, 1951) has concluded that the Anterior Media is still present in the lower neuropteroid groups, and Bradley (1939) has applied this terminology to the Chrysopidae.

The forewing of *Chrysopa oculata* Say is shown in fig. 1, and subsequent references are to this figure. If the proximal portion of the media (m) is examined, the typical anterior (MA) and posterior (MP 1+2) branches can be seen. MP 1+2, however, travels only a short distance before coalescing again with MA. This course of MP 1+2 (Tillyard's median loop) results in the formation of a small cell between the free portions of MA and MP 1+2 (which Tillyard termed the first intramedian cell (im_1)). After extending longitudinally for a short distance, M again branches with MA continuing longitudinally while MP 1+2 turns sharply posteriorly. This section of MP 1+2 and the first branch of the cubitus (cu_1) form the distal and posterior margins of a cell directly behind im_1 , the proximal margin being formed by a vein from MP 1+2 to Cu_1 . This cell is designated as the third median cell (3M). The relationship of the shape and relative area between cells im and 3M is quite important in delimiting several of the genera. It should be mentioned that Banks in his very extensive series of publications followed the terminology of McLachlan (1868) and referred to these two cells collectively as the "third cubital cell" which he considered to be divided by the "divisory veinlet" (MP 1+2), and that Smith (1922, 1932) and Killington (1937) have employed the nomenclature of Comstock.

A second feature of the wings is the presence of one or two prominent series of cross veins in the distal portions. These cross veins were apparently called "gradates" for the first time by Schneider (1851).

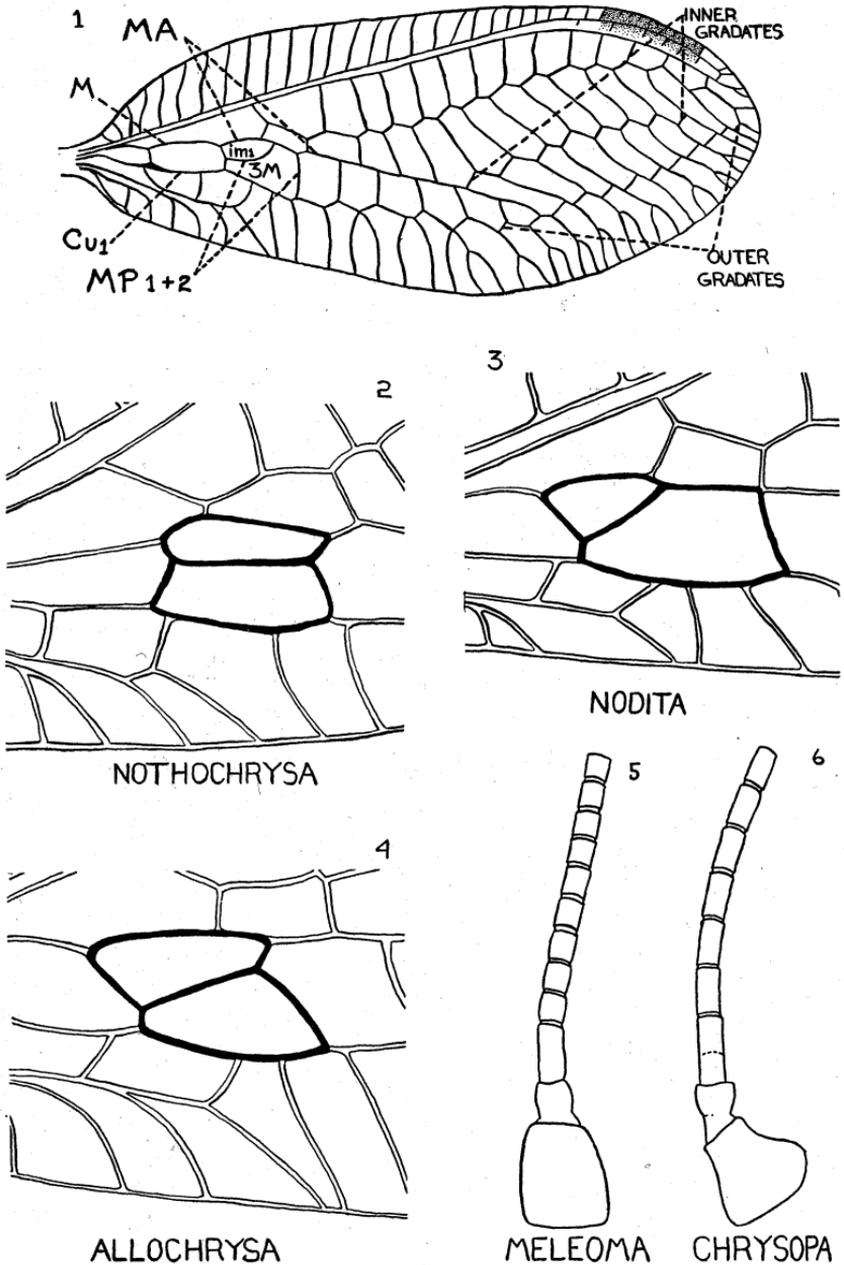


Fig. 1, *Chrysopa oculata* Say, right forewing (x7). M, media; MA, anterior branch of media; Cu 1, first branch of cubitus; MP 1+2, posterior branch of media; im 1, first intramedian cell; 3M, third median cell. Fig. 2, *Nothochrysa californica* Banks, medial branches in right forewing (x15). Fig. 3, *Nodita americana* (Banks), medial branches in right forewing (x15). Fig. 4, *Allochrysa virginica* (Fitch), medial branches in right forewing (x15). Fig. 5, *Meleoma verticalis* Banks, basal segments of antenna of a female (x30). Fig. 6, *Chrysopa rufilabris* Burmeister, basal segments of antenna (x30).

Many taxonomic papers have referred to the gradates without a clear explanation of the fact that they are the cross veins between the branches of the radial sector.

KEY TO THE GENERA OF NEARCTIC CHRYSOPIDAE

1. Median loop (MP 1+2) in forewing following an oblique or longitudinal course and not meeting MA so that cell im_1 is closed by a cross vein and is subequal to cell 3M (figs. 2, 4) 2
 Median loop in forewing following a more sharply oblique course and meeting MA so that cells im_1 and 3M are unequal in shape and area (fig. 1) 3
2. Median loop following a longitudinal course so that cells im_1 and 3M are rectangular in shape (fig. 2); veinlets of outer and posterior margins of wings mostly simple; color dark brown or black *Nothochrysa*, p. 182
 Median loop following an oblique course so that cells im_1 and 3M are trapezoidal in shape (fig. 4); veinlets of outer and posterior margins of wings mostly forked; color yellow or greenish yellow *Allochrysa*, p. 183
3. Hind wings with two series of gradates 4
 Hind wings with one series of gradates, the inner series absent 7
4. Males with a prominent tubercle between the antennae (females without such a tubercle); proximal half of flagellum with most segments nearly as broad as long (fig. 5); bases of antennae usually widely separated, the distance often equal to or greater than the width of the basal segment *Meleoma*, p. 185
 An interantennal tubercle never present; proximal half of the flagellum with most segments plainly longer than broad (fig. 6); bases of antennae close together, usually separated by a distance which is less than the width of the basal segment 5
5. Antennae much longer than the wings; pterostigma of fore and hind wings dark, usually marked with dark brownish or purplish spots; first cross vein from radial sector meeting MA at a point more basal than the origin of the radial sector *Nodita*, p. 186
 Antennae at most equal to or usually shorter than the wings; pterostigma at most only slightly darkened, never spotted; first cross vein from radial sector meeting MA at a point which is even with or more distal than the origin of the radial sector 6
6. Prothorax longer or at least nearly as long as broad; usually slender insects; color ranging from yellow to dark green *Chrysopa*, p. 188
 Prothorax much broader than long; robust species, predominantly brown *Abachrysa*, p. 197
7. Fore wings with one series of gradates *Chrysopiella*, p. 198
 Fore wings with two series of gradates *Eremochrysa*, p. 198

Genus *Nothochrysa* McLachlan

McLachlan, R., 1868, Trans. Ent. Soc. Lond. (for 1868), p. 195 (type species by original designation, *Chrysopa fulviceps* Stevens).

This genus is quite distinct, being well-characterized by the longitudinal course of vein MP 1+2 which results in cells im_1 and 3M hav-

ing the same shape and area (fig. 2). The veinlets reaching the outer and posterior margins of the wings are for the most part unforked, although this is subject to some variation. The uniformly dark coloration of all of the wing veins is another valuable taxonomic character which will aid in distinguishing this genus from the occasional aberrant forms of other genera in which vein MP 1+2 is longitudinal. Only one species is known to occur in the Nearctic region.

Nothochrysa californica Banks

Nothochrysa californica Banks, 1892, Trans. Amer. Ent. Soc. 19:373.

Distribution.—Described from southern California. Recorded from Washington and British Columbia.

Genus **Allochrysa** Banks

Banks, N., 1903, Trans. Amer. Ent. Soc. 29:143 (type species by original designation, *Chrysopa virginica* Fitch)

As previously indicated, the exact status of this genus is somewhat in doubt at the present time. Banks (1903) characterized this genus as follows: “. . . the third cubital cell is nearly equally divided, the divisory veinlet running into the end-veinlet of the cell instead of into the upper margin. The antennae are quite long. . . .” Navas (1917) pointed out that these characters are also found in *Leucochrysa* McLachlan, and therefore synonymized these two genera. Subsequent American workers have failed to recognize this action of Navas, although no explanation of this viewpoint has appeared in the literature. The authors feel that such discussion is definitely warranted by the nature of the objections which Navas raised.

Banks (1903) separated his genus *Allochrysa* from *Leucochrysa* McLachlan on the basis of the course of veins MA and MP 1+2. In *Allochrysa* the median loop was described and figured as following a slightly oblique course and not reaching vein MA so that cells im_1 and 3M are quadrangular and subequal (fig. 4). In contrast, *Leucochrysa* was shown with the median loop more sharply oblique and meeting vein MA so that the cell im_1 is smaller and triangular and cell 3M is larger and polygonal as in Fig. 3. This characterization of *Leucochrysa* was quite correct for the Nearctic species of *Leucochrysa* with which Banks was dealing in 1903 (subsequently placed in the genus *Nodita* Navas); however, the Neotropical *Leucochrysa varia* (Schneider), which was designated as the type species of *Leucochrysa* by McLachlan (1868), does not conform to this description. A figure of the wing in Schneider's description of *L. varia* (1851), as well as a series of this species in the U. S. National Museum (det. Henry K. Townes) examined by the authors, show the same venational characteristics as *Allochrysa* Banks.

It is admitted that in the Chrysopidae venational differences alone are probably poor characters on which to separate genera, and it is hoped that future morphological studies will result in the discovery of

more satisfactory characters. Work of this sort may very well show that these two genera are, after all, distinct. For these reasons the authors have continued to recognize *Allochrysa* Banks as a valid, though at present poorly characterized, genus, which is but slightly distinct from *Leucochrysa* McLachlan. Since *Leucochrysa* McLachlan in this sense probably occurs only rarely north of Mexico, the problem of separating these two genera in identification work is minimized.

***Allochrysa longicornis* (Walker)**

Osmylus longicornis Walker, 1853, Cat. Neurop. Ins. Coll. British Mus., p. 235.

Meleoma longicornis, Hagen, 1861, Smiths. Misc. Coll., pp. 210-211.

Leucochrysa longicornis, Banks, 1907, Catalogue of the Neuropteroid Insects (except Odonata) of the U. S. Amer. Ent. Soc., p. 26.

Allochrysa longicornis, Banks, 1920, Bull. Mus. Comp. Zool. 64:339.

Walker (1853) described this species from Georgia (Abbott's Collection). Aside from the original description, the authors can find no additional Nearctic records for this species.

***Allochrysa virginica* (Fitch)**

Chrysopa virginica Fitch, 1856, First Rpt. Ins. N. Y., p. 91.

Nothochrysa phantasma MacGillivray, 1894, Can. Ent. 26:170-171; Banks, 1895, Trans. Amer. Ent. Soc. 22:315.³

Nothochrysa virginica, Banks, 1895, Trans. Amer. Ent. Soc. 22:315.

Allochrysa virginica, Banks, 1903, Trans. Amer. Ent. Soc. 29:143.

Leucochrysa virginica, Navas, 1917, Ent. Mit. 6:279.

Leucochrysa californica Navas, 1928, Revista R. Acad. Cien. Nat. (Madrid) 25:36; Banks, 1938, Can. Ent. 70:122 (as *Allochrysa californica* Navas).

A color variety was described by Banks (1938) under the name *ocala*.

Distribution.—Type locality, Cartersville, Virginia. Recorded from Washington, D. C., New York, Massachusetts, North Carolina, Tennessee, and Florida.

***Allochrysa parvula* Banks**

Allochrysa parvula Banks, 1903, Trans. Amer. Ent. Soc. 29:143-144.

Leucochrysa parvula, Navas, 1917, Ent. Mit. 6:279.

Distribution.—Type locality, Runnymede, Florida.

***Allochrysa arizonica* Banks**

Allochrysa arizonica Banks, 1906, Psyche 13:98.

Distribution.—Type locality, Palmerlee, Arizona.

³In the case of subjective synonymy the second entry indicates the first worker to regard that name as a synonym.

Genus **Meleoma** Fitch

Fitch, A., 1856, First Rpt. Ins. N. Y., pp. 81-82 (type species by monotypy, *Meleoma signoretti* Fitch).

In wing venation and many other characters this genus is similar to *Chrysopa* Leach, however the presence of a prominent tubercle between the bases of the antennae in the males is quite distinctive. Females are separated from *Chrysopa* females by the characters given in the key. In both sexes of several species the basal segment of the antennae is slightly concave on its medial surface.

This genus is essentially northern and western in its distribution, although in the East several scattered records have been obtained from as far south as North Carolina and Tennessee.

Meleoma signoretti Fitch

Meleoma signoretti Fitch, 1856, First Rpt. Ins. N. Y., p. 82.

Distribution.—Described from Vermont. Recorded from Ontario, Quebec, New Hampshire, New York, Maryland, Virginia, District of Columbia, North Carolina, Tennessee, Minnesota, and British Columbia.

Meleoma innovata (Hagen)

Chrysopa innovata Hagen, 1861, Smiths. Misc. Coll. 4:222-223.

Meleoma innovata, Banks, 1903, Trans. Amer. Ent. Soc. 29:158.

Distribution.—Type locality Mexico City, Mexico. Recorded from New Mexico. A specimen from Colorado Springs, Colorado (D. G. Denning) is in the collections of the University of Wyoming.

Meleoma mexicana Banks

Meleoma mexicana Banks, 1898, Trans. Amer. Ent. Soc. 25:201.

Meleoma innovata, Banks, 1903, Trans. Amer. Ent. Soc. 29:158.

Meleoma mexicana Banks, 1904, Trans. Amer. Ent. Soc. 30:104.

Banks (1948) states that he incorrectly synonymized *mexicana* with *innovata*.

Distribution.—Type locality, Amecameca, Mexico. Recorded from New Mexico.

Meleoma emuncta (Fitch)

Chrysopa emuncta Fitch, 1856, First Rpt. Ins. N. Y., p. 88.

Meleoma slossonae Banks, 1896, Ent. News 7:95; Banks, 1924, Bull. Mus. Comp. Zool. 69:432.

Meleoma emuncta, Banks, 1924, Bull. Mus. Comp. Zool. 69:432.

Distribution.—Described from New York. Recorded from Ontario, Quebec, British Columbia, Maine, New Hampshire. We have a male with all green venation collected at Mountain Lake, Virginia, June 25, 1953.

Meleoma verticalis Banks

Meleoma verticalis Banks, 1908, Trans. Amer. Ent. Soc. 34:259.

In this species the third antennal segment is about five times as long as the second (Smith 1932).

Distribution.—Described from Colorado. Recorded from New Mexico, British Columbia, and Ontario. We have seen specimens from Arizona and California.

***Meleoma pallida* Banks**

Meleoma pallida Banks, 1908, Trans. Amer. Ent. Soc. 34:260.

Distribution.—Described from Huachuca Mountains, Arizona. We have seen specimens from Arizona and California.

***Meleoma comata* Banks**

Meleoma comata Banks, 1950, Psyche 57:45-46.

Distribution.—Described from San Bernardino County, California.

***Meleoma cavifrons* Banks**

Meleoma cavifrons Banks, 1950, Psyche 57:46-47.

Distribution.—Type locality, Pinecrest, Tuolumne County, California.

***Meleoma delicata* Banks**

Meleoma delicata Banks, 1950, Psyche 57:48.

Distribution.—Type locality, Fort Wingate, New Mexico. Recorded from Santa Cruz County, Arizona.

Genus *Nodita* Navas

Navas, L., 1916, Broteria (Braga) 14:21-22. (Type species by subsequent designation, *Chrysopa intermedia* Schneider.)

This genus has been regarded as having been erected in 1917 by Navas, and is so recorded by Neave (1940) and in the Zoological Record for 1917 (XII, p. 186); however, the previous year (1916) Navas described *ramosi* and *melanocera* from Brazil under the generic name *Nodita*. Although a formal description of the genus was not contained in that publication, the authors feel that the description of these species was sufficient to comply with Article 25 of the International Rules of Zoological Nomenclature, and that the generic name *Nodita* was validated in 1916. The following year Navas (1917) published a full description of the genus *Nodita*, and selected *Chrysopa intermedia* Schneider as the type species. A list of the species which were referred to *Nodita*, however, failed to include the two species which had been described the previous year.⁴

This confused situation has a very important consequence. The subsequent designation of *Chrysopa intermedia* Schneider as the type species was incorrect because the type should have been selected from the two species which were included in the genus at the time of its validation in 1916. A strict interpretation of Article 30 of the *Regles* would require that the designation of *C. intermedia* Schneider as the

⁴The fact that Navas in 1917 described *Nodita ramosa* (note spelling) from Guatemala (Mem. Pont. Acc. Romano 3:16) is irrelevant to the present discussion.

type species be rejected, and that either *Nodita ramosi* Navas, 1916, or *N. melanocera* Navas, 1916, be selected as the type species.

Such a course of action is clearly not advisable in this case. In view of the questionable status of many of the Navasian species, the retention of the old species *Chrysopa intermedia* Schneider as the type is more likely to promote "stability and universality" than would be the case if one of the 1916 species were selected. Furthermore, the authors feel that it is more desirable to have a type species designated by the author of the genus than by a subsequent worker. Navas apparently considered that the species which he discussed in 1916 and in 1917 belonged to the same genus, which he felt was typified by the *C. intermedia* of Schneider. In addition to these considerations, it should be pointed out that the 1917 paper was published in wartime Germany, while the 1916 paper was published in Navas's native Spain which was neutral. It is, therefore, entirely possible that the 1917 paper describing *Nodita* Navas was actually intended to have been published prior to the publication of the descriptions of *N. ramosi* Navas and *N. melanocera* Navas in 1916. For these reasons the authors have accepted Navas' designation of *C. intermedia* Schneider as the type species of *Nodita* Navas, 1916.

Navas (1917) characterized *Nodita* as having the antennae longer than the wings and the pterostigma darkened within. The crux of his description is contained in the following statement (transl.) :

In the middle section of the anterior wing a third small cell is divided into two very unequal parts by a small, slanting, nearly straight vein which begins near the cubitus and extends to the media in front of the apex of the small cell; therefore, the anterior cell, or rather the "divisoria" is somewhat triangular and smaller, the posterior (cell) is polygonal and larger.

This characterization (fig. 3) of the basal branches of the media is in agreement with the venation of the type species as figured by Schneider (1851). The Nearctic species of the genus for the most part share this arrangement of the basal branches of the media with the type species and are, therefore, easily separated from the closely related *Allochrysa* Banks and *Leucochrysa* McLachlan. In the Neotropical region, however, a confusing array of species seems to form a completely intergrading series from the type species of *Leucochrysa* McLachlan to the type species of *Nodita* Navas. The distinctness of *Nodita* Navas is therefore open to some doubt. Banks (1945) recognized this problem, and although he continued to recognize the validity of *Nodita* Navas, he sought characters other than the course of the basal branches of the media to separate it from closely related genera. Pending a thorough study of the affinities of these genera the authors have continued to recognize *Nodita* Navas.

In North America this genus is southern and southwestern in its distribution.

Nodita floridana (Banks)

Leucochrysa floridana Banks, 1897, Ent. News 8:184.

Nodita floridana, Navas, 1917, Ent. Mit. 6:280.

Distribution.—Type locality, Lake Worth, Florida. Also recorded from Mississippi.

Nodita americana (Banks)

Leucochrysa americana Banks, 1897, Proc. Ent. Soc. Wash. 4:175.

Nodita americana, Navas, 1917, Ent. Mit. 6:280.

Distribution.—Type locality, Auburn, Alabama. Recorded from Texas and Kansas.

Nodita nigrinervis Banks

Nodita nigrinervis Banks, 1939, Notulae Naturae Acad. Nat. Sci. Phil. 32:1.

Distribution.—Type locality, Satan Pass, McKinley County, New Mexico. We have seen specimens from Texas.

Nodita texana Banks

Nodita texana Banks, 1939, Notulae Naturae Acad. Nat. Sci. Phil. 32:3.

Distribution.—Type locality, Trevis County, Texas. Recorded from Austin, Texas.

Nodita callota (Banks)

Leucochrysa callota Banks, 1914, Proc. Acad. Nat. Sci. Phil. 66:626.

Nodita callota, Banks, 1939, Notulae Naturae Acad. Nat. Sci. Phil. 32:2.

Distribution.—Type locality, Austin, Texas.

Nodita pavida (Hagen)

Chrysopa pavida Hagen, 1861, Smiths. Misc. Coll. 4:216.

Chrysopa lateralis, Banks (not Guerin), 1903, Trans. Amer. Ent. Soc. 29:150, 161;

Banks (1938) corrects this misidentification.

Nodita pavida, Banks, 1939, Notulae Naturae Acad. Nat. Sci. Phil. 32:2.

Distribution.—Described from Mexico and South Carolina. The authors have a specimen from Kitty Hawk, North Carolina, and have seen one from Florida.

Nodita antennata (Banks)

Leucochrysa antennata Banks, 1906, Trans. Amer. Ent. Soc. 33:5-6.

Nodita antennata, Banks, 1939, Notulae Naturae Acad. Nat. Sci. Phil. 32:2.

Distribution.—Type locality, Tuxpan, Mexico. In the U. S. National Museum there are specimens from Texas.

Genus **Chrysopa** Leach

Leach, 1815, Brewster's Edinburgh Encyclopedia 9(1):138. (Type species by subsequent designation *Hemerobius perla* Linné.)

This large cosmopolitan genus is represented in our fauna by 47 named species. Although the authors feel that some of these species are poorly characterized and are of doubtful validity, we have included in our list all species whose validity has not been seriously questioned up to this time.

Banks (1950) has proposed a division of this genus into two subgenera, based primarily on the shape of the costal cells. These groups are distinguished as follows:

- Forewing with costal cells at the widest part of the wing lengthened so that at least one of them is as long as high *Chrysopa* (*Yumachrysa*)
 Forewing with costal cells at the widest part of the wing higher than long *Chrysopa* (*Chrysopa*)

Subgenus **Yumachrysa** Banks

Banks, 1950, Psyche 57:51 (type species by original designation *Chrysopa* (*Yumachrysa*) *apache* Banks).

This section of the genus is confined to our southwest where it is represented by three species.

Chrysopa (**Yumachrysa**) **apache** Banks

Chrysopa apache Banks, 1938, Can. Ent. 70:121.

Distribution.—Type locality, Globe, Arizona; additional records from Davis Mts., Texas, Palmerlee, Arizona, and from near Sells, Arizona.

Chrysopa (**Yumachrysa**) **yuma** Banks

Chrysopa yuma Banks, 1950, Psyche 57:49-50.

Distribution.—Type locality, Fort Yuma, California.

Chrysopa (**Yumachrysa**) **clarivena** Banks

Chrysopa clarivena Banks, 1950, Psyche 57:50-51.

Distribution.—Type locality, Ehrenberg, Arizona.

Subgenus **Chrysopa** Leach

Five species groups occur within this subgenus, and although they probably do not represent phyletic units, they facilitate specific identifications within this section of the genus. These groups may be separated by the following key (modified from Smith, 1932):

1. Antennae except the basal segment black, or with at least the basal fourth blackish 2
 Antennae either completely unmarked or at most with a black or brown ring on the second segment 3
2. Basal segment of the antennae unmarked *nigricornis* group
 Basal segment of the antennae with a dark red or black line on the lateral surface *lineaticornis* group
3. Antennae with a black or brown ring on the second segment *oculata* group
 Antennae entirely pale 4
4. All veins entirely pale, or at most with only an occasional dark cross vein *plorabunda* group
 Gradates and some other veins marked with black or brown *rufilabris* group

NIGRICORNIS Group

Chrysopa nigricornis Burmeister

Chrysopa nigricornis Burmeister, 1839, Handbuch der Entomologie 2:980.

Chrysopa colon Fitch, 1856, First Rpt. Ins. N. Y., p. 88; Hagen, 1861, Smiths. Misc. Coll. 4:214.

Distribution.—Described from North America. This species is widely distributed in the Nearctic region.

Chrysopa explorata Hagen

Chrysopa explorata Hagen, 1861, Smiths. Misc. Coll. 4:217.

Distribution.—Described from Mexico. Recorded from Arizona.

Chrysopa coloradensis Banks

Chrysopa coloradensis Banks, 1895, Trans. Amer. Ent. Soc. 22:314-315.

Distribution.—Type locality, Fort Collins, Colorado. Smith (1932) states that the range of this species appears to extend from Colorado northwesterly. The authors have seen specimens from Utah, California, and Oregon.

Chrysopa columbiana Banks

Chrysopa columbiana Banks, 1903, Trans. Amer. Ent. Soc. 29:150.

Distribution.—Type locality, Washington, D. C. Recorded from British Columbia, Iowa, and North Carolina. We have a specimen from Mt. Lake, Virginia.

Chrysopa excepta Banks

Chrysopa excepta Banks, 1911, Trans. Amer. Ent. Soc. 37:340.

Distribution.—Type locality, Fort Wingate, New Mexico. We have seen specimens from Utah and Wyoming.

Chrysopa nanina Banks

Chrysopa nanina Banks, 1911, Trans. Amer. Ent. Soc. 37:340.

Distribution.—Type locality, Palmerlee, Arizona.

LINEATICORNIS Group

Chrysopa lineaticornis Fitch

Chrysopa lineaticornis Fitch, 1856, First Rpt. Ins. N. Y., pp. 91-92.

Chrysopa puncticornis Fitch, 1856, First Rpt. Ins. N. Y., p. 92; Hagen, 1861, Smiths. Misc. Coll., p. 214.

?*Chrysopa ampla* Walker, 1853, Cat. Neuropt. Coll. British Mus. 2:268; Banks, 1903, Trans. Amer. Ent. Soc. 29:151.

Chrysopa stichoptera Navas, 1914, Bull. Brook. Ent. Soc. 9:61-62. NEW SYNONYMY.

The description by Navas of *C. stichoptera* contains no characters which can be used to separate it from *C. lineaticornis*, and therefore *stichoptera* is here considered a synonym.

Distribution.—Described from Central New York. Recorded from Quebec, New England, Maryland, Tennessee, North Carolina and Michigan. We have a specimen from Richmond, Virginia.

***Chrysopa cubana* Hagen**

Chrysopa cubana Hagen, 1861, Smiths. Misc. Coll. 4:215.

Chrysopa lateralis, Banks (not Guerin), 1903, Trans. Amer. Ent. Soc. 29:150, 161; Banks, 1938, Can. Ent. 70:122.

Chrysopa sanchezi Navas, 1924, Bol. Soc. Ent. Espana Saragossa (Cuba) 7:52; Banks, 1938, Can. Ent. 70:122.

Banks (1938) discussed the similarity between *C. sanchezi* Navas and *C. cubana* Hagen, and retained *sanchezi* as a varietal name of *cubana*.

Distribution.—Described from Cuba and Virginia. Recorded from North Carolina and Florida. (We have seen a specimen from Tepic, Mexico.)

OCULATA Group

***Chrysopa oculata* Say**

Chrysopa oculata Say, 1839, Jour. Acad. Nat. Sci. Phil. 8:45.

Chrysopa chlorophana Burmeister, 1839, Handbuch der Entomologie, p. 979; Smith, 1922, Cornell Univ. Agr. Expt. Sta. Memoir 58:1345.

Chrysopa euryptera Burmeister, 1839, Handbuch der Entomologie, p. 980; Banks, 1903, Trans. Amer. Ent. Soc. 29:161.

Chrysopa latipennis Schneider, 1851, Mon. Chrysopae, p. 118; Banks, 1903, Trans. Amer. Ent. Soc. 29:161.

Chrysopa albicornis Fitch, 1856, First Rpt. Ins. N. Y., p. 84; Smith, 1922, Cornell Univ. Agr. Expt. Sta. Memoir 58:1343.

Chrysopa illepida Fitch, 1856, First Rpt. Ins. N. Y., pp. 84-85; Banks, 1892, Trans. Amer. Ent. Soc. 19:373.

Chrysopa omikron Fitch, 1856, First Rpt. Ins. N. Y., p. 85; Hagen, 1861, Smiths. Misc. Coll., p. 211.

Chrysopa xanthocephala Fitch, 1856, First Rpt. Ins. N. Y., pp. 85-86; Smith, 1932, Ann. Ent. Soc. Amer. 25:589.

Chrysopa fulvibucca Fitch, 1856, First Rpt. Ins. N. Y., p. 86; Banks, 1892, Trans. Amer. Ent. Soc. 19:373.

Chrysopa mississippiensis Fitch, 1856, First Rpt. Ins. N. Y., p. 86; Banks, 1892, Trans. Amer. Ent. Soc. 19:373.

Chrysopa bipunctata Fitch, 1856, First Rpt. Ins. N. Y., pp. 87-88; Hagen, 1861, Smiths. Misc. Coll., p. 214.

Chrysopa transmarina Hagen, 1861, Smiths. Misc. Coll., p. 213; Banks, 1903, Trans. Amer. Ent. Soc. 29:161.

?*Nothochrysa annulata* MacGillivray, 1894, Can. Ent. 26:169-170; Banks, 1903, Trans. Amer. Ent. Soc. 29:143.

Chrysopa separata Banks, 1911, Trans. Amer. Ent. Soc. 37:341; Smith, 1932, Ann. Ent. Soc. Amer. 25:590-591.

Chrysopa rubicunda Navas, 1913, Ent. Zeitsch. 27:20; Smith, 1932, Ann. Ent. Soc. Amer. 25:587.

Smith (1932) described a color variety under the name of *carei*.

This species is extremely variable, and there are sixteen names which may be applied to identify individuals which differ primarily in color markings on the head and wings. There are many inconsistencies and intergradations in the varietal patterns. Smith (1932) reported that *ubicornis* and *chlorophana* cross readily with other varieties, and Bickley (1952) after crossing and inbreeding the varieties *oculata* and *illepida* attempted to explain the genetic basis for the inheritance of the characters which caused the naming of these two forms. It is concluded that the varietal names have little value because a variety is not a taxonomic category. All of the species names except *annulata* have been clearly placed in synonymy by Banks (1903) and Smith (1922 and 1932). In the case of *annulata*, Banks (1903) suspected that the specimen in question was a sport of *oculata*.

Distribution.—Described from "U. S." This species occurs throughout the Nearctic region and is the most common lacewing in most areas.

Chrysopa chi Fitch

Chrysopa chi Fitch, 1856, First Rpt. Ins. N. Y., p. 87.

Chrysopa oculata, Banks (not Say), 1892, Trans. Amer. Ent. Soc. 19:373; Smith, 1922, Cornell Univ. Agr. Expt. Sta. Mem. 58:1352.

Chrysopa upsilon Fitch, 1856, First Rpt. Ins. N. Y., p. 87; Banks, 1903, Trans. Amer. Ent. Soc. 29:148-149.

Chrysopa hypsilon var. *haematica* Navas, 1918, Mem. de la Real Acad. y Artes de Barcelona 14:354-355; Smith, 1932, Ann. Ent. Soc. Amer. 25:592.

Smith (1922 and 1932) recognizes *upsilon* as a colorational variety of *chi*.

Distribution.—Described from New York. Recorded from New York, New Hampshire, New Jersey, Washington, D. C., Tennessee, and Minnesota, and from seven Canadian provinces, New Brunswick west to British Columbia. We have two specimens from Mountain Lake, Virginia, and have seen specimens from California.

Chrysopa assimilis Banks

Chrysopa assimilis Banks, 1899, Trans. Amer. Ent. Soc. 25:202.

Distribution.—Described from Ashland, Oregon and Hood River, Oregon.

Chrysopa pleuralis Banks

Chrysopa pleuralis Banks, 1911, Trans. Amer. Ent. Soc. 37:341-342.

Distribution.—Described from North Boulder Creek, Boulder County, Colorado and Steamboat Springs, Colorado. Recorded from Alberta and British Columbia.

PLORABUNDA Group

Chrysopa plorabunda Fitch

Chrysopa plorabunda Fitch, 1856, First Rpt. Ins. N. Y., p. 88.

Chrysopa robertsonii Fitch, 1856, First Rpt. Ins. N. Y., p. 88; Banks, 1903, Trans. Amer. Ent. Soc. 29:162.

Chrysopa pseudographa Fitch, 1856, First Rpt. Ins. N. Y., p. 89; Banks, 1903, Trans. Amer. Ent. Soc. 29:162.

Chrysopa illinoensis Shimer, 1865, Proc. Ent. Soc. Phil. 4:208; Riley, 1870, Second Rpt. Ins. Missouri, pp. 25-26.

Chrysopa californica Coquillett, 1890, Rpt. Calif. State Board Hort., p. 288; Smith, 1932, Ann. Ent. Soc. Amer. 25:594.

Distribution.—Described from New York and Illinois. There are records from many states and Canadian provinces. This species is undoubtedly one of the most common and widely distributed of any in the nearctic region. Dr. R. I. Sailer collected specimens at Fort Yukon and Kotzebue, Alaska in July, 1951.

Chrysopa harrisii Fitch

Chrysopa harrisii Fitch, 1856, First Rpt. Ins. N. Y., p. 90.

Chrysopa externa Hagen, 1861, Smiths. Misc. Coll. 4:221; Smith, 1932, Ann. Ent. Soc. Amer. 25:596.

Chrysopa stenostigma Navas, 1914, Bull. Brook. Ent. Soc. 9:61 NEW SYNONYMY.

The description by Navas of *C. stenostigma* contains no characters which can be used to separate it from *C. harrisii*, and therefore *stenostigma* is here considered a synonym.

Distribution.—Described from New York. This species, which is often difficult to separate from *plorabunda*, is widely distributed throughout the Nearctic region, having been recorded from many states and provinces. A specimen was collected at Fort Yukon, Alaska by R. I. Sailer in July 1951.

Chrysopa signatalis Banks

Chrysopa signatalis Banks, 1911, Trans. Amer. Ent. Soc. 37:342-343.

Distribution.—Type locality, Brownsville, Texas. We have seen specimens from Texas and Lower California.

Chrysopa vegata Navas

Chrysopa vegata Navas, 1917, Mem. Pont. Acc. Romana Series 11, 3:6.

The description mentions two dark spots on each gena in addition to the longitudinal stripe. This species seems to be practically indistinguishable from *C. plorabunda*.

Distribution.—Type locality, Jemez Springs, New Mexico.

Chrysopa downesi Smith

Chrysopa downesi Smith, 1932, Ann. Ent. Soc. Amer. 25:594-595.

Distribution.—Type locality, Kelowna, British Columbia. Recorded from other localities in British Columbia and Saskatchewan. Introduced into New Zealand from Canada.

Chrysopa comanche Banks

Chrysopa comanche Banks, 1938, Can. Ent. 70:119-120.

Distribution.—Type locality, Laredo, Texas. Recorded from New Mexico, Arizona, and California. We have seen specimens from Colorado.

***Chrysopa sperryae* Banks**

Chrysopa sperryae Banks, 1943, Psyche 50:74-75.

Distribution.—Type locality, Riverside, California. We have seen specimens from California, Arizona, Colorado, and British Columbia.

RUFILABRIS Group

***Chrysopa rufilabris* Burmeister**

Chrysopa rufilabris Burmeister, 1839, Handbuch der Entomologie 2:979.

Chrysopa repleta Walker, 1853, Cat. Neuropt. Coll. British Mus. 2:244; Banks, 1903, Trans. Amer. Ent. Soc. 29:161.

Chrysopa novaeboracensis Fitch, 1856, First Rpt. Ins. N. Y., p. 90; Hagen, 1861, Smiths. Misc. Coll. 4:219.

Chrysopa citri Ashmead, 1880, Orange Insects, (Jacksonville, Fla.) p. 13; Banks, 1907, Catalogue of the Neuropteroid Insects (except Odonata) of the U. S., Amer. Ent. Soc., p. 28.

Distribution.—Described from "Mittel Amerika and Mexiko." This species has been recorded from many localities in eastern North America, Ontario to Florida and as far west as Minnesota and Kansas. According to Brimley (1938) it is second to *C. oculata* in abundance in North Carolina. In collections of the California Academy of Sciences are specimens from California, Arizona, Texas, Nevada, Oregon and Montana.

***Chrysopa quadripunctata* Burmeister**

Chrysopa quadripunctata Burmeister, 1839, Handbuch der Entomologie 2:980.

Chrysopa sulphurea Fitch, 1856, First Rpt. Ins. N. Y., p. 89; Banks, 1903, Trans. Amer. Ent. Soc. 29:162.

Chrysopa sicheli Fitch, 1856, First Rpt. Ins. N. Y., pp. 89-90; Hagen, 1861, Smiths. Misc. Coll. 4:218.

Distribution.—Described from North America. This species has been recorded from seven eastern states, New York to Tennessee; from six central states, Minnesota to Texas; and from Vancouver Island.

***Chrysopa interrupta* Schneider**

Chrysopa interrupta Schneider, 1851, Mon. Chrysopae, p. 76.

Chrysopa attenuata Walker, 1853, Cat. Neuropt. Coll. British Mus. 2:242; Kimmins, 1940, Ann. Mag. Nat. Hist. 11(5):447.

Chrysopa rufilabris, Banks (not Burmeister), 1903, Trans. Amer. Ent. Soc. 29:161; Kimmins, 1940, Ann. Mag. Nat. Hist. 11(5):447.

Banks (1903) synonymized *attenuata* Walker with *rufilabris* Burm. Kimmins (1940) pointed out that *attenuata* Walker is actually a synonym of *interrupta* Schneider. This species is very close to *C. rufilabris*.

Distribution.—Described from Pennsylvania. Recorded from seven eastern states, New York to Alabama and from Illinois, Kansas, and Missouri. We have collected a few specimens in Maryland and Virginia. A specimen from La Grange, California is in the collections of

the University of Wyoming. We have seen specimens from California and Arizona.

***Chrysopa thoracica* Walker**

Chrysopa thoracica Walker, 1853, Cat. Neuropt. Coll. British Mus. 2:243.

Distribution.—Described from St. Domingo. Banks (1938b) records this species from Coconut Grove, Florida.

***Chrysopa bimaculata* McClendon**

Chrysopa bimaculata McClendon, 1901, Psyche 9:215.

Distribution.—Type locality, Laredo, Texas. Recorded also from San Antonio and Austin and from Florida.

***Chrysopa schwarzi* Banks**

Chrysopa schwarzi Banks, 1903, Trans. Amer. Ent. Soc. 29:146.

Distribution.—Type locality, Las Vegas, Hot Springs, New Mexico. Recorded from Arizona.

***Chrysopa medialis* Banks**

Chrysopa medialis Banks, 1903, Trans. Amer. Ent. Soc. 29:154.

Distribution.—Type locality, High Island (Md.) near the District of Columbia.

This species appears in the literature subsequent to the original description only in Banks' (1907) catalogue. It is very near *rufilabris* and *quadripunctata*. We have a specimen which fits the description; but it was collected January 29, 1954, and it is probably an overwintering *rufilabris* in which colorational changes have been brought about by cold weather. The type specimens were collected in late September so that they may have been affected by cold. The validity of this species is questionable.

***Chrysopa cockerelli* Banks**

Chrysopa cockerelli Banks, 1903, Trans. Amer. Ent. Soc. 29:154-155.

Distribution.—Type locality, East Las Vegas, New Mexico. Recorded from Kansas and British Columbia. We have seen specimens from Arizona and California.

***Chrysopa arizonensis* Banks**

Chrysopa arizonensis Banks, 1903, Trans. Amer. Ent. Soc. 29:155.

Distribution.—Type locality, Yuma, Arizona. We have seen a specimen from California.

***Chrysopa majuscula* Banks**

Chrysopa erythrocephala Banks, 1898, Trans. Amer. Ent. Soc. 25:201-202 (not *C. erythrocephala* Leach, an old Palaearctic species).

Chrysopa majuscula Banks, 1906, Psyche 13:98.

Distribution.—Type locality, San Bernardino, California. Recorded from New Mexico, Minnesota and Departure Bay (B. C.), Canada.

Chrysopa injusta Banks

Chrysopa marginalis Banks, 1906, Trans. Amer. Ent. Soc. 32:5 (not *Chrysopa marginalis* Navas, 1905).

Chrysopa injusta Banks, 1906, Psyche 13:98-99.

Distribution.—Described from “the mountains near Claremont, California.”

Chrysopa robusta Banks

Chrysopa robusta Banks, 1906, Trans. Amer. Ent. Soc. 32:5.

Distribution.—Type locality, Tyron (probably Tryon), North Carolina.

Chrysopa placita Banks

Chrysopa placita Banks, 1908, Trans. Amer. Ent. Soc. 34:259.

Distribution.—Described from Clear Creek and Chimney Gulch, Golden, Canada.

Chrysopa incompleta Banks

Chrysopa incompleta Banks, 1911, Trans. Amer. Ent. Soc. 37:340-341.

Distribution.—Described from Beaufort and Raleigh, North Carolina.

Chrysopa furcata Banks

Chrysopa furcata Banks, 1911, Trans. Amer. Ent. Soc. 37:342.

Distribution.—Type locality, Ft. Wingate, New Mexico. Recorded from Stanford University, California.

Chrysopa luctuosa Banks

Chrysopa luctuosa Banks, 1911, Trans. Amer. Ent. Soc. 37:343.

Distribution.—Type locality, Ft. Wingate, Colorado. We have seen a specimen from Oregon.

Chrysopa gravida Banks

Chrysopa gravida Banks, 1911, Trans. Amer. Ent. Soc. 37:343.

Distribution.—Type locality, Yosemite, California.

Chrysopa intacta Navas

Chrysopa intacta Navas, 1912, Broteria (Braga) 10:199 (translation of description is given by Smith (1932)).

Distribution.—Type locality, Toronto, Canada. Recorded from Quebec and Missouri.

Chrysopa bicarnea Banks

Chrysopa bicarnea Banks, 1920, Bull. Mus. Comp. Zool. 64:338-339.

Distribution.—Type locality, Miami, Florida. We have seen specimens from Texas.

Chrysopa sierra Banks

Chrysopa sierra Banks, 1924, Bull. Mus. Comp. Zool. 65:431.

Distribution.—Type locality, San Gabriel Mts., Sister Elsie Peak, California.

Chrysopa seminole Banks

Chrysopa seminole Banks, 1924, Bull. Mus. Comp. Zool. 65:432.

Distribution.—Type locality, Marco, Florida. We have seen a specimen from Arizona.

Chrysopa slossonae Banks

Chrysopa emuncta, Banks (not Fitch), 1903, Trans. Amer. Ent. Soc. 29:154.

Chrysopa slossonae Banks, 1924, Bull. Mus. Comp. Zool. 65:432.

One of the syntypes of this species is a specimen from Franconia, New Hampshire that Banks (1903) incorrectly identified as *Chrysopa emuncta* Fitch, a species which he subsequently (1924) transferred to the genus *Meleoma*. Simultaneously *M. slossonae* Banks, 1896, was synonymized with *M. emuncta* (Fitch 1856).

Distribution.—Described from Hendersonville, North Carolina; Franconia, New Hampshire; and Great Falls, Virginia.

Chrysopa antillana Navas

The authors have been unable to locate any formal description of this species. Smith (1931) quotes Banks as believing that the name appeared in a synoptic table of Navas's in 1924, which would validate the name. Banks (1938) records this species from Florida.

Chrysopa mohave Banks

Chrysopa mohave Banks, 1938, Can. Ent. 70:120.

Distribution.—Described from Claremont and Stanford University, California, and Chiricahua Mts., Arizona.

Chrysopa crotchi Banks

Chrysopa crotchi Banks, 1938, Psyche 45:76.

Distribution.—Type locality, Victoria, Vancouver Island (British Columbia).

Chrysopa pinalena Banks

Chrysopa pinalena Banks, 1950, Psyche 57:49.

Distribution.—Type locality, the Pinals, Globe, Arizona.

Genus **Abachrysa** Banks

Banks, N., 1938, Psyche 45:75 (type species by original designation, *Chrysopa eureka* Banks).

In this genus the pronotum is about twice as broad as long, and the second median cell is no longer than the first.

Abachrysa eureka (Banks)

Chrysopa eureka Banks, 1931, Psyche 38:174.

Abachrysa eureka, Banks, 1938, Psyche 45:75.

This species is robust, predominantly brown, with eight prominent black spots on the pronotum; there are many dark cross veins. A specimen in the U. S. National Museum from Georgia has curved ridges under each antennal socket.

Distribution.—Type locality, Hope, Arkansas. Known to occur in Mississippi and Georgia.

Genus **Chrysopiella** Banks

Banks, N., 1911, Trans. Amer. Ent. Soc. 37:34 (type species by original designation, *Chrysopa sabulosa* Banks).

This genus is characterized almost entirely by the absence of the inner series of gradate veins in both fore and hind wings. The three described species are greenish yellow with wholly pale venation, although occasionally a specimen will have a few of the veins marked with dark brown or black.

Representatives of this genus have so far been reported only in the Western United States and Mexico.

Chrysopiella sabulosa (Banks)

Chrysopa sabulosa Banks, 1897, Proc. Ent. Soc. Wash. 4:174.

Chrysopiella sabulosa, Banks, 1911, Ann. Ent. Soc. Amer. 37:344.

Distribution.—Type locality, Colorado. Reported from New Mexico and Texas by Banks (1903 and 1948) and from Arizona and Kansas by Smith (1934). The authors have seen specimens from Utah and Wyoming.

Chrysopiella pallida Banks

Chrysopiella pallida Banks, 1911, Ann. Ent. Soc. Amer. 37:345.

This species is separated with great difficulty from *C. sabulosa* by the presence of a median triangular spot below the antennae.

Distribution.—Type locality, Rincon, New Mexico. The authors have seen specimens from Utah, Oregon and Arizona.

Chrysopiella minor Banks

Chrysopiella minor Banks, 1935, Psyche 42:55.

This species is separated with great difficulty from *C. sabulosa* by the presence of dark lines on the vertex.

Distribution.—Type locality, Umatilla, Oregon.

Genus **Eremochrysa** Banks

Banks, N., 1903, Trans. Amer. Ent. Soc. 29:158 (type species by original designation *Chrysopa punctinervis* McLachlan).

To this genus are referred species which have two series of gradate veins in the forewings and only one (the outer) series in the hind wings. The veins are marked with dark areas or small spots to a varying degree. Aberrations in the number and location of gradates are not uncommon. In general *Eremochrysa* species are brownish, not green.

Banks (1950) provided keys to the species and figures illustrating significant characters. Except for *E. (Lolochrysa) canadensis* (Banks) and *E. (Eremochrysa) punctinervis* (McLachlan) members of this genus appear to be confined to Western North America, particularly the southwestern U. S.

Banks (1950) grouped six species into the subgenus *Lolochrysa* which was distinguished from the nominal subgenus primarily on the

basis of having the lower terminal process of the male abdomen up-curved with simple hairs. In the subgenus *Eremochrysa*, the male terminal "process is straight and provided with reclinate hairs or bristles." *E. (Lolochrysa)* is a poorly defined group partly because one of the included species (*spilota*) was described without reference to male specimens. In using Banks' paper to determine species of the genus *Eremochrysa* it is necessary to refer to both of his "tables" and make careful reference to his specific descriptions. This is particularly important in the case of females. In *E. (Lolochrysa)* all species except *spilota* lack "dotting of the veins." In *E. (Eremochrysa)* four of the seven species have dotting on the veins.

Subgenus *Eremochrysa* Banks

Eremochrysa (Eremochrysa) punctinervis (McLachlan)

Chrysopa punctinervis McLachlan, 1869, Ent. Mo. Mag. 6:24.

Eremochrysa punctinervis, Banks, 1903, Trans. Amer. Ent. Soc. 29:159.

Distribution.—Described from Bosque County, Texas. According to Banks (1950) this species is widely distributed in the western states, most common in the southern ones; eastward it extends to Florida.

Eremochrysa (Eremochrysa) fraterna (Banks)

Chrysopa fraterna Banks, 1897, Proc. Ent. Soc. Wash. 4:174-175.

Eremochrysa fraterna, Banks, 1903, Trans. Amer. Ent. Soc. 29:159.

Distribution.—Described from Colorado. Banks (1950) reported this species as occurring over most of the western states. We have seen many specimens in which all the wing veins are dark. The dark band on the femora is variable.

Eremochrysa (Eremochrysa) rufina Banks

Eremochrysa rufina Banks, 1950, Psyche 57:54-55.

Distribution.—Type locality, Grand Canyon, Arizona.

Eremochrysa (Eremochrysa) tibialis Banks

Eremochrysa tibialis Banks, 1950, Psyche 57:55-56.

Distribution.—Type locality, Florence Junction, Arizona. Recorded from Utah and California. We have seen specimens from Nevada.

Eremochrysa (Eremochrysa) attilis Banks

Eremochrysa attilis Banks, 1950, Psyche 57:56-57.

Distribution.—Type locality, Stockton Pass, Graham County, Arizona.

Eremochrysa (Eremochrysa) ruffrons Banks

Eremochrysa ruffrons Banks, 1950, Psyche 57:57-58.

Distribution.—Type locality, Globe, Arizona.

Eremochrysa (Eremochrysa) pumilis Banks

Eremochrysa pumilis Banks, 1950, Psyche 57:58.

Distribution.—Type locality, Garland, Colorado. Recorded from Utah and Texas. We have seen specimens from California.

Subgenus **Lolochrysa** Banks

Banks, 1950, Psyche 57:59 (type species by original designation, *Eremochrysa (Lolochrysa) hageni* Banks).

Eremochrysa (Lolochrysa) hageni Banks

Eremochrysa hageni Banks, 1903, Trans. Amer. Ent. Soc. 29:158-159.

Distribution.—Type locality, Austin, Texas. Recorded from Utah, New Mexico, and Arizona.

Eremochrysa (Lolochrysa) californica Banks

Eremochrysa californica Banks, 1906, Trans. Amer. Ent. Soc. 32:6.

Distribution.—Type locality, Santa Clara County, California. Recorded from Arizona.

Eremochrysa (Lolochrysa) canadensis (Banks)

Chrysopa canadensis Banks, 1911, Trans. Amer. Ent. Soc. 37:339-340.

Eremochrysa canadensis, Banks, 1950, Psyche 57:64,66.

Distribution.—Type locality, Go Home Bay, Lake Huron, Canada. Recorded from Maine, New Hampshire, and Massachusetts.

Eremochrysa (Lolochrysa) spilota Banks

Eremochrysa spilota Banks, 1950, Psyche 57:61.

Distribution.—Type locality, Yuma, California.

Eremochrysa (Lolochrysa) pima Banks

Eremochrysa pima Banks, 1950, Psyche 57:61-62.

Distribution.—Type locality, S. Fork Camp, White Mts., Arizona. Recorded from New Mexico.

Eremochrysa (Lolochrysa) yosemite Banks

Eremochrysa yosemite Banks, 1950, Psyche 57:63-64.

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