

## REVIEW OF THE GENUS DOLDINA STAL (Hemiptera: Reduviidae)

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*Doldina* Stal, 1859, is a new-world genus pertaining to the tribe Zelini of the subfamily Harpactorinae. Most of its species are quite similar in size and general habitus. They are slender, usually parallel-sided forms, averaging 16 to 17 mm. in length, with bodies six to eight times as long as wide, with the pronotum lightly declivent anteriorly, and with a porrect, more or less cylindrical head which commonly is about twice as long as wide across the eyes. In dorsal view the head gradually narrows toward the base, becoming about one-fourth narrower there than at or just behind the ocelli; in side view it appears almost uniformly thick, with dorsal and ventral surfaces subparallel, nearly to the base where it is abruptly coarctate (especially below) to form a short neck. There is a dorsal spine at the base of each antenniferous tubercle, longer than the vertical height of an eye in one or two species, somewhat shorter in some others, and reduced almost to the point of obsolescence in a few species.

The pronotum is gradually narrowed toward the front, the anterior angles are thick and blunt, and the anterior margin between them is deeply, roundly emarginate. The two lobes are separated by a shallow sulcus; the anterior one is commonly smooth and more or less shining, the posterior one commonly is closely but not deeply punctate. The posterior lobe, like the abdominal margin, varies greatly in its armature in different species. Sometimes it bears a pair of discal spines and a pair of lateral spines above the humeri; in other species the discal pair alone, or both pairs, may be greatly reduced or entirely absent, but no discal spines are ever found unless lateral spines are also present. In some species marginal spines occur on all the connexival segments (five in males, six in females), while in others they may be restricted to the first three, the first two, or even the first segment alone. In these latter cases the next following segment may have its apical angle acutely prominent, in the form of a small tooth rather than a spine; and

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sometimes individuals are not symmetrical in this respect on the two sides of the body.

The front and hind legs are long, the middle ones notably shorter, and though the femora are not spinose beneath, they all are armed with a small but distinct apical spine on each side. The middle legs often have both femur and tibia lightly curved downward, and the front femora of one species have a slight bisinuous lateral curvature. The front femora and tibiae are provided with short, dense pubescence on the entire length of the ventral surface. In addition, all the legs, the antero-ventral part of the prothorax, the sides of the head (especially behind the eyes), and the first antennal segment bear much longer pilosity whose density differs in the various species.

In generic keys *Doldina* is coupled with *Ricolla* Stal, as they are the only American Zelini whose femora are spined at the tips. This is a rather superficial character, and the true relationships of *Doldina* may possibly be elsewhere. The species of *Ricolla* are more robust and less elongate, with the abdomen more definitely widened behind the middle, and the head in side view tapers gradually toward the base. There is some resemblance between *Doldina* and *Debilis* Stal, but the latter has a shorter and differently formed head, the costal margin of the corium is concavely sinuate (which is rarely seen in *Doldina*), and the post-scutellum is separated from the scutellum: *Debilis* possibly is closer to *Lindus* Stal and *Socius* Champion. Some species of *Heza*, too, superficially resemble *Doldina*, but they are at once distinct by possessing the small mesopleural tubercle characteristic of members of the tribe Harpactorini. A comprehensive study of the entire tribe Zelini will be necessary to determine the phylogenetic relationships of *Doldina* and its allies with any certainty.

The more robust form of *Doldina lauta* (Stal) and its somewhat more declivent pronotum may perhaps have been among the factors which led Stal (1862) to erect the genus *Hygromystes* for it, though in subsequent keys (1866) he used only the spinose or non-spinose nature of the pronotum to separate *Doldina* and *Hygromystes*. In his last work on American Reduviidae (1872), he treated these two taxa as subgenera, employing the junior name *Hygromystes* for the combined genus. Bergroth (1913), approving this consolidation, restored the senior name *Doldina*, and described a new species which he stated to be "exactly intermediate in structure



between the subgenera." Fracker and Bruner (1924), overlooking Bergroth's paper, redescribed this species under another name and proposed a new subgenus *Ceballum*, in *Hygromystes*, for the intermediate category. Blatchley (1926) quite properly rejected all subgenera in *Doldina*. In our opinion the characters on which they were based have no more than specific value, and indeed they vary somewhat even within some of the species.

Wygodzinsky (1949) catalogued seven species of *Doldina*. Two of these are here synonymized with others, and two new species are described. The species are predominantly neotropical in their distribution. In the North American material examined we can recognize only a single species, most common in the Gulf states but ranging northward along the coast at least to North Carolina (to Maryland, according to Van Duzee, 1917) and southward to Cuba, Isle of Pines, and Honduras.

Little has been published regarding the habits of *Doldina*. Blatchley (1926) found *D. interjungens* "frequent on tall dead grasses along the borders of ponds, lakes, and the sloughs of the Everglades," and certainly the type of this then undescribed species was one of the two specimens of "*Hygromystes* sp." that Torre-Bueno and Engelhardt listed as taken on sedges back of the beach at Roanoke Island, North Carolina. Barber and Bruner (1937) said this same species was taken in Cuba by sweeping coarse, dry grasses in old fields. Also, they listed it from one locality more than 2,500 feet above sea level, but it seems to be primarily a lowland species. Elkins (1951) said that in Texas it is "abundant along the Gulf," though occurring elsewhere in the state, sometimes being found on trees; and in Texas and Louisiana it has been reported as coming to lights (Elkins, 1951; Sibley, 1951).

Dr. T. H. Hubbell, Director of the University of Michigan Museum of Zoology, has most kindly furnished us field data on numerous specimens of *D. interjungens* taken by him in Florida and Louisiana. Most of them were collected from grasses in or bordering salt marshes, often at night, when they were found by sweeping or by searching with a head-light. Others came from grasses and sedges bordering fresh-water lakes or from fresh-water marshes, and a few were swept from grasses in palmetto-scrub fields at night or were taken at lighted sheet.

Some specimens of *Doldina bicarinata* from Panama, in the U. S. National Museum, are labelled "sweeping around cornfields," others



"from grass and cowpeas." Dr. Wygodzinsky, when he visited Florida in 1955, told us of having found *Doldina* commonly on marsh grasses near Rio de Janeiro.

We wish here to express our thanks to the several individuals and institutions who have loaned us material or have furnished us information regarding specimens in collections under their care. These are Dr. R. I. Sailer (U. S. National Museum), Dr. H. Ruckes (American Museum of Natural History), Dr. H. Dietrich (Cornell University), Dr. H. V. Weems, Jr. (State Plant Board of Florida), Dr. G. E. Wallace (Carnegie Museum), Dr. T. H. Hubbell (University of Michigan Museum of Zoology), Dr. E. S. Ross (California Academy of Sciences), Dr. S. von Keler (Museum of the University of Berlin), Dr. J. Maldonado Capriles (University of Puerto Rico), Ing. F. Valdes Barry (Estación Experimental Agronómica, Santiago de las Vegas, Cuba), and Dr. R. Malaise (Naturhistoriska Riksmuseum, Stockholm). We are especially indebted to the last-named for the privilege of examining type material of two species described by Carl Stal.

### Genus *Doldina* Stal

*Doldina* Stal 1859: 366 [in key] and 368 [diagnosis] [monobasic; haplotype *D. carinulata*, new species]; Stal 1866: 292 and 296; Stal 1872: 78 [as subgenus of *Hygromystes*]; Bergroth 1913: 263; Van Duzee 1917: 266 [catalog]; Blatchley 1926: 567 and 580 [diagnosis, erroneous in part, based on one North American species]; Readio 1927: 168 and 202 [translation, erroneous in part, of Stal's original diagnosis]; Wygodzinsky 1949: 38 [catalog].

*Hygromystes* Stal 1862: 75 [monobasic; haplotype *H. lautus*, new species]; Stal 1866: 292; Stal 1872: 68 and 78; Fracker and Bruner 1924: 172 [subgenera characterized]; Bruner 1926: 71 [in key].

*Ceballum* Fracker and Bruner 1924: 172 [as subgenus of *Hygromystes*] [monobasic; haplotype *Hygromystes (Ceballum) armatus*, new species]; Bruner 1926: 71; Blatchley 1926: 580, note 70 [as synonymous with *Doldina*].

#### 1. *Doldina cubana* Barber and Bruner

*Doldina cubana* Barber and Bruner 1946: 56, figs. 2-4 [♂; Veguita, Oriente Province, Cuba; type in U. S. National Museum]; Wygodzinsky 1949: 38.4.

The characters used in the key below to separate this species from *D. bicarinata* are drawn from the original description and the figures given by the authors. *D. cubana* is known only from the type specimen, and it is the only species of *Doldina* that we have not seen.



2. *Doldina bicarinata* Stal

*D[oldina]. bicarinata* Stal 1866: 296.1 [♀; "Brasilia borealis," in Stockholm Museum]; Barber and Bruner 1946: 58; Wygodzinsky 1949: 38.2.

*H[ygromystes]. (Doldina) bicarinata*, Stal 1872: 78.1.

This species shows the highest development of spines that we have seen in the genus. The post-antennal spines are longer than the vertical height of an eye, the pronotal spines (both discal and lateral) are longer still, and all the connexival segments bear spines which commonly decrease in length posteriorly, the last pair being less than half as long as the first pair. Pilosity of the body parts is relatively thin and short, few of the hairs being longer than the dorsal width of an eye. The specimens we have seen range from 14.6 to 17.3 mm. in length.

*Male.* Ventral rim of the genital fossa turned outward at posterior apex (Fig. 1), forming a slight, blunt prominence beyond dorsal apex and foreshadowing the condition figured by Barber and Bruner for *D. cubana*; median process of hypopygial margin subvertical, slender, very slightly tapering from base to middle, thence subparallel, extreme tip reflexed.

This is a common species in Panama, judging from the number of specimens examined, and it ranges southward as far as Paraguay. We have seen material from the following localities:

PANAMA: Juan Mina Citrus Plantation, 3♂, 3♀; Flat Rock Plantation, Chagres River, 1 mile above Juan Mina, 3♂, 3♀; Limon Plantation, 2♂, 1♀; Barro Colorado, 1♀; Tabernilla, 1♂ (U.S.N.M.). "Panama," 1♀ (Carnegie Mus.).

COLOMBIA: Palmira, Dept. Valle del Cauca, 3 exx. (Maldonado Capriles coll.); Palmyra, 1♀, "Colombia," 1♀ (U.S.N.M.).

BRASIL: Corumbá, Mato Grosso, lowland, March, 1♂, 3♀; Rio Purús, Hyutanahan, 1♂ (Carnegie Mus.).

PERU: Tingo María, 2200 ft., 1♀ (Amer. Mus. N. H.).

PARAGUAY: Villeta, 1♂ (Carnegie Mus.).

3. *Doldina carinulata* Stal

*D[oldina]. carinulata* Stal 1859: 368.1 [♀, "Brasilia," in Berlin Museum]; Stal 1866: 296 [comparative notes]; Barber 1923: 28 [as "*D. carinulatus*"]; Wygodzinsky 1949: 38.3 [catalog].

*H[ygromystes]. (Doldina) carinulatus*, Stal 1872: 78.2.



*Doldina antiguensis* Barber 1923: 28 [NEW SYNONYMY] [ $\delta$ ; Antigua, in American Museum of Natural History]; Barber and Bruner 1946: 58 [as "*D. antiquensis*;" comparative notes]; Wygodzinsky 1949: 38.1 [catalog].

Dr. S. von Keler, in correspondence, informs us that the unique female type from which Stal's original description was drawn is not now in the Berlin Museum. However, we have received a male from the Stockholm Museum whose pin bears the following items: (1) a label with the word "Amazon" in faded handwriting; (2) a printed label, "Stevens;" (3) a label with "*carinulata* Stal" in Stal's handwriting; (4) a printed label, "TYPUS," on heavy red paper; and (5) a pink label with the printed number "173" and a handwritten number "53." Except that it is a male, and that all four pronotal spines are equally long, this specimen conforms well with the original description. Since the holotype of *D. carinulata* seems no longer to be extant, this male may be accepted as neotype of the species.

This is another wide-ranging species, occurring from the Lesser Antilles to Paraguay. It agrees in size with *D. bicarinata*, but is readily separable from that species by the shorter cephalic spines (only half to two-thirds as long as the height of an eye), by the presence of spines on the first three connexival segments only, and by the terminal structures of the abdomen, among other characters. There is a strong tendency for individuals of this species to become suffused with red, particularly on the legs, antennae, dorsum of head, and to a much lesser degree on the corium; and the dorsum of the abdomen often has conspicuous bright red longitudinal streaks. The costal margin of the corium is more distinctly sinuate than in other species of *Doldina*.

The thoracic spines vary greatly in *D. carinulata*. The lateral spines are well developed as a rule, though shorter than in *D. bicarinata*, and the discal spines may be as long as the lateral ones. Often, however, they are somewhat shorter. The greatest reduction we have seen is in a Venezuelan specimen whose lateral spines are as small as in many *D. interjungens* and whose discal spines are subhorizontal, concolorous, and so small as easily to be overlooked. Such specimens can be separated from *interjungens* by the more widely depressed postero-lateral margins of the pronotum and the lobulate posterior angles, by having spines on three connexival segments instead of two, and by the genital characters. As the specific name indicates, the pronotal carinulae are usually



more distinct here than in other species, with one on the lateral margin of the posterior lobe and two each side on its disk anteriorly.

Dr. Herbert Ruckes has very kindly compared for us the type of *Doldina antiguensis* Barber with a male which we had identified as *carinulata* by comparison with the neotype. He reports that *antiguensis* is at most only a minor variant of the present species, with the posterior lobe of the pronotum a trifle longer, its carinulae somewhat less conspicuous, and with all three connexival spines equally long, but with genitalia apparently identical.

*Male.* Genital capsule with a narrowly thickened posterior margin, the hind edge transverse; posterior median process a slender spine, slightly triangularly widened at very base, extreme tip reflexed, barb-like; claspers relatively short and thick, their tips (in posterior view) separated from median process by less than their own thickness.

*Female.* Pygidium subvertical, bent backward on apical half, apex not or very slightly caudad of the lightly produced apex of 8th tergite.

The material before us is from the following localities:

WEST INDIES: Dominica, B.W.I., 2 ♀ (U.S.N.M.).

BRITISH GUIANA: Plantation Drill, 1 ♀ (U.S.N.M.).

VENEZUELA: Tacarigua, Mérida State, 1 ♂ (U.S.N.M.). Puerto Cabello, 1 ♂ (Calif. Acad. Sci.).

BRASIL: "Amazon," ♂ neotype as noted above (Stockholm Mus). Santarem, State of Para, 1 ♂ (Carnegie Mus.). State of São Paulo, Ilha Seca, 1 ♂, and Onda Verde, Fazenda São João, 1 ♂ (exchange from Instituto Oswaldo Cruz). Chapada, State of Mato Grosso, 3 ♂, 3 ♀ (Carnegie Mus.).

PARAGUAY: Horqueta, 1 ♂, 1 ♀ (Van Duzee collection in Calif. Acad. Sci.).

#### 4. DOLDINA LIMERA, new species

Length, ♂, 15.8 mm., humeral width 2.1 mm.

Pale testaceous; membrane hyaline, with numerous rather large fuscous spots inside closed cells and some faint brownish markings outside them; hind femora lightly spotted with brown; connexival segments, above and below, with a small piceous spot in outer apical angle, spots of last two segments becoming linear;



abdominal dorsum with a broad brown median stripe, interrupted at most segmental incisures, with irregular longitudinal lines of black and red each side of median stripe, and with a submarginal row of large, round, brownish spots, one at middle and one at hind margin of each segment. Male genital segment with a few blackish spots.

Head, including neck, slightly longer (257:246)<sup>3</sup> than its humeral width, and about two-fifths as wide anteriorly (87:209) as across humeri. Posterior margin transverse before scutellum, posterior angles obtusely rounded, not at all produced backward as lobules, postero-lateral margins not sinuate; supra-humeral spine minute (0.07 mm. long), discal spines represented by minute black conical tubercles. Scutellum much longer than wide (140:96), its Y-shaped tumid area triangularly impressed at about mid-length of scutellum. Outer apical angle of first connexival segment with a small, blunt-tipped, digitiform spinule, second segment with only a small callose node, both of these piceous-brown. Median posterior process of hypopygial margin (Fig. 2) horizontal, directed forward, spatulate, a little broader at middle than at base, very plainly grooved on upper surface, extreme tip reflexed. Internal genitalia not dissected.

Female unknown.

Holotype, ♂, Bonito Province, Pernambuco, Brasil, 2-4-83, in the P. R. Uhler collection, U. S. National Museum.

Readily separated from all known species of *Doldina* by the maculations of the membrane, the hind femora, and the connexival angles, as well as by the position and form of the male hypopygial process. No other *Doldina* has been seen with such greatly reduced spines on the first connexival segment.

### 5. *Doldina lauta* (Stal)

*Hygromystes lautus* Stal 1862: 75.1 [♂, ♀; Rio de Janeiro, in Stockholm Museum and Stal collection].

*H. (Hygromystes) lautus*, Stal 1872: 78.3.

*Doldina lauta*, Wygodzinsky 1949: 38.6 [catalog].

This seems to be an uncommon species, as there are only four specimens in the material we have examined, one of these being

<sup>3</sup> Unless otherwise stated, all measurements are in hundredths of a millimeter.



Stal's female cotype. It is larger and more robust than the other *Doldina* species (though some females of *D. interjungens* are quite as long), the pronotum is slightly more declivent, and the anterior femora show a slight but distinct bisinuous lateral curvature in both sexes. The post-antennal spines are small, the pronotal disk is unarmed, and only one specimen (the male) has as much as a small tubercle at the site of the lateral spine. The first two connexival segments are spined. The hemelytra slightly surpass the abdomen.

*Male.* Genital capsule about one-fifth narrower than the fossa formed for its reception by the seventh sternite, unique in *Doldina* in having a deep, linear, median, longitudinal impression from base to about the middle, also with a shallow transverse impression shortly before the apical margin. Median process of hypopygial margin directed obliquely forward and upward, its sides subparallel on basal three-fourths of its length, then curved backward so that the apical portion is nearly vertical, postero-dorsal side shallowly grooved at base; claspers very short and thick, failing by nearly their own length to reach the median process.

*Female.* Pygidium flat, vertical, not reflexed on apical half, overhung by 8th tergite whose posterior margin is roundly and broadly produced very distinctly caudad of apex of 9th tergite.

We have seen the following material:

BRASIL: Rio de Janeiro, 1♀ (cotype of Stal, in Stockholm Museum). Lassance, Minas Gerais, 1♀ (U.S.N.M.). "Entre Rios, Brazil," 1♂; Rio de Janeiro, 1, multilated (Carnegie Mus.).

Several places in Brasil formerly were known as Entre Rios. Since this male bears the same accession number as specimens taken at Chapada and Corumbá, the locality in question would seem to be the one now known as Rio Brillhante, in the state of Mato Grosso not far north of the Paraguayan border.

#### 6. *DOLDINA* *PENALEA*, new species

Length, ♂, 16.4 mm., humeral width 2.0 mm.

Pale yellowish testaceous or stramineous; head with a faintly reddish vitta behind each ocellus, reaching base of head; front lobe of pronotum with lateral margins lightly embrowned; a broad longitudinal stripe on corium and sides of venter sometimes lightly suffused with reddish; membrane hyaline, unspotted; apical



fourth of posterior femora either lightly infuscated or slightly tinged with reddish; abdominal dorsum with a brown median vitta, more or less interrupted at segmental incisures, and with a narrower sublateral vermilion streak each side.

Head, including neck, about four-fifths as long as pronotum on median line (239:274) and more than twice as long as its own transocular width (239:104); posterior lobe one-seventh longer (128:112) than anterior lobe measured to tip of tylus; eyes less than half as wide in dorsal view (25:54) than minimum distance between them, ocelli slightly nearer to one another (49:54) than the inter-ocular distance; pre-ocular length of head, seen from side, to tip of tylus two-thirds the post-ocular length (76:113) and one-half greater than length of eye (76:50), tylus surpassing antenniferous tubercles by about thickness of first rostral segment. Cephalic spines small, triangular, subconical, not longer than diameter of ocellus. Lengths of antennal segments I:II:III = 772:205:528, fourth segment approximately twice as long as second, first segment one-fourth longer than head, pronotum, and scutellum combined, with thick erect silvery pilosity, hairs on basal fifth twice as long as thickness of segment, becoming progressively shorter and somewhat more oblique on distal part, those near tip shorter than thickness of segment; second segment much less pilose, third with short, semi-appressed pilosity only. Head, except gula, with short, sub-appressed pilosity, and also (except dorsum of posterior lobe) thickly clothed with long, often curved, silvery hairs, some of which are nearly as long as distance between eyes.

Pronotum one-third longer on median line than its transhumeral width (274:204); anterior lobe two-fifths shorter than posterior lobe (102:172), impunctate, with a short, deep, median longitudinal impression behind middle; posterior lobe closely concolorously punctate, median longitudinal groove broad, shallow, almost obsolete, extending forward to transverse sulcus and there bordered at each side by a short, low carinula which extends to posterior fourth of anterior lobe; discal and lateral spines entirely wanting; posterior margin virtually straight, transverse, posterior angles minimally extended backward, postero-lateral margins straight, oblique; interlobular sulcus tri-sinuate on each side of median line, interrupted only by the paramesal carinulae. Scutellum  $5/7$  longer than wide at base (120:76), lightly depressed basally at middle between arms of a Y-shaped subcallose ridge; extreme tip not recurved. Heme-



lytra nearly reaching apex of abdomen (♀) or very slightly surpassing it (♂).

Front femora nearly one-third longer (650:500) than head and pronotum conjoined, one-half thicker than middle or hind femora, slightly longer than front tibiae; middle femora one-third shorter (500:675) than hind ones; all femora and tibiae quite thickly set with erect silvery hairs about as long as thickness of front femora, front legs also with very short, dense, erect pubescence beneath as in other species of *Doldina*.

*Male*. Median process of hypopygial margin, seen from behind, a very slender erect spine (Fig. 3). Internal genitalia: basal plate moderately robust, with anterior bridge (Fig. 5); aedeagus when retracted mostly covered by basal plate (Fig. 7); everted endosoma (Fig. 6) with two club-like small conformities at dorsal mid-portion, these and several posterior areas of endosoma with many tiny spines on surface.

*Female*. Eighth tergite broad, twice as wide across base (including connexivum) as its median length (Fig. 4); apex of abdomen with rather long pilosity, partly or largely concealing the oblique pygidium.

*Holotype*: ♂, Rio Paulaya, El Dorado (Departamento Colón), Honduras, April 16, 1923 (T. H. Hubbell), in University of Michigan Museum of Zoology; collected from a rather small, dry, sedge marsh in an open forest of Caribbean pine and oaks. Paratypes, 2 ♂, taken with the type, in University of Michigan Museum and Hussey collection. Other paratypes as follows:

HONDURAS: 1 ♂, Rio Clauro, Depto. Colón, April 18, 1923, taken beside a trail through lowland selva forest (T. H. Hubbell); Puerto Castilla, March 23, 1924 (J. Becquaert); both of these in Univ. Mich. Museum.

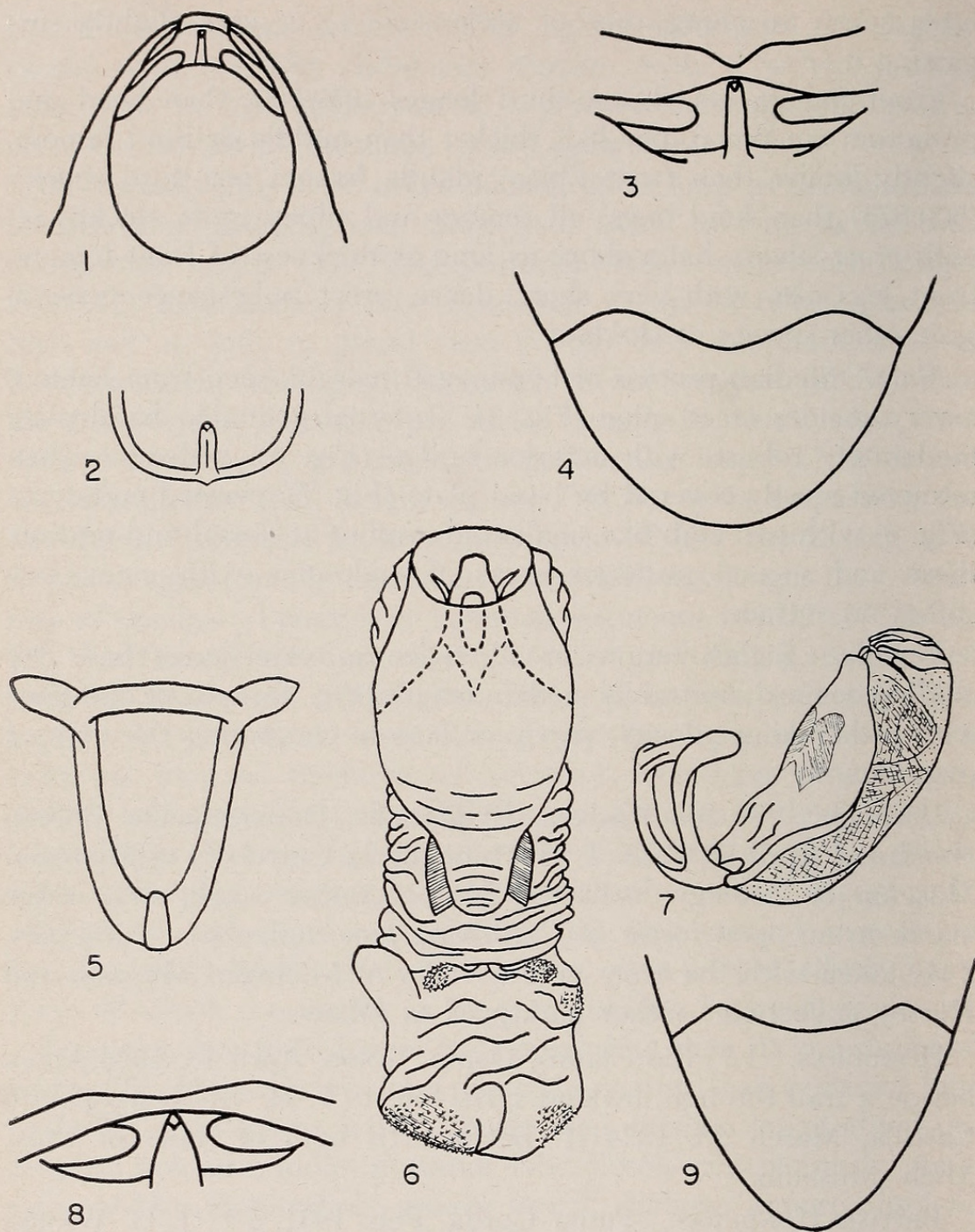
BRITISH HONDURAS: Punta Gorda, Feb. 1931, 1 ♀ (J. G. White), in Elkins collection.

EL SALVADOR: Porillo, Santa Cruz, July 9, 1953, 1 ♂ (Salazar); same locality, Dec. 21, 1953 (M. S. V.), 2 ♂; in U. S. National Museum.

NICARAGUA: Corinto, Jan. 26, 1930, 1 ♀ (T. O. Zscholke), in California Academy of Sciences.

ECUADOR: Guayaquil, 1941, 2 ♀ (C. L. Fagan), in U. S. National Museum.





## EXPLANATION OF FIGURES

1. *Doldina bicarinata*, male, apex of abdomen, ventral aspect.
2. *D. limera*, male, hypopygial margin and median process, dorsal aspect.
3. *D. penalea*, male, apex of abdomen, posterior aspect.
4. *D. penalea*, female, eighth abdominal tergite.
5. *D. penalea*, basal plate.
6. *D. penalea*, everted endosoma, dorsal aspect.
7. *D. penalea*, retracted aedeagus.
8. *D. interjungens*, male, apex of abdomen, posterior aspect.
9. *D. interjungens*, female, eighth abdominal tergite.



This species most closely resembles *D. bicarinata* in the structure of the male genital segment, both species having the apex of the last tergite rather deeply notched above (Fig. 2), and both have quite similar spine-like median processes on the hypopygial rim; yet these two species represent the two extremes as regards the development of body spines within the genus. *D. penalea* lacks all thoracic spines, the connexivum bears spines on the first segment alone, and the cephalic spines are extremely small. Also, the present species is probably the most pilose of them all, with the long erect hairs of the hind tibiae quite thickly placed on its basal two-thirds, with the first antennal segment much more pilose than in most *Doldinas*, and with a more pronounced comb of long hairs, many of them curved, on each side of the head behind the eyes. The individuals seen range from 15.8 to 17.2 mm. in length.

#### 7. *Doldina interjungens* Bergroth

*Hygromystes* sp., Torre-Bueno and Engelhardt 1910: 150 [listed, Roanoke Island, N. C.].

*Doldina interjungens* Bergroth 1913: 263 [♀; Roanoke Island, N. C., coll. by Engelhardt, in Torre-Bueno collection]; Van Duzee 1917: 267.794 [catalog]; Blatchley 1926: 580.555 [redescribed; *D. praetermissa* Bergroth as new synonym]; Readio 1927: 203 [Bergroth 1913 quoted in full]; Bruner and Barber 1937: 188 [with *D. armata* (F.&B.) as new synonym]; Brimley 1938: 73 [listed only]; Wygodzinsky 1949: 38.5 [catalog]; Sibley 1951: 92.44; Elkins 1951: 409.

*Doldina praetermissa* Bergroth 1913: 264 [♀, Charlotte Harbor, Fla. (Mrs. Annie Trumbull Slosson), and ♀, Belize, British Honduras (C. F. Baker)]; Barber 1914: 506; Van Duzee 1917: 267.793 [catalog]; Barber 1923: 29; Blatchley 1926: 581 [as synonym of *D. interjungens*]; Readio 1927: 203 [Bergroth's original description copied]; Wygodzinsky 1949: 38.7 [catalog]; Sibley 1951: 92.43 [listed from Louisiana]; Elkins 1951: 409 [listed from Texas].

*Hygromystes (Ceballum) armatus* Fracker and Bruner 1924: 172 [♂, Ceballos, Camagüey Province, Cuba; disposition of type not stated]; Bruner 1926: 80.27; Blatchley 1926: 580, note 70 [as probable synonym of *D. interjungens*]; Bruner and Barber 1937: 188 [as new synonym of *D. interjungens*].

[*Hygromystes flaccidus* Uhler MS], in Heidemann collection, Cornell University.

This is another variable species, ranging in length from 14.6 to 19.0 mm., and in humeral width from 1.65 to 2.13 mm. The largest females rival *D. lauta* in length but are at once distinct by the



narrowly tapering abdomen which is not widest behind the middle and by the much shorter hemelytra.

No discal spines occur on the pronotum of *D. interjungens*, and commonly the lateral spines are reduced to tiny spinules; often they too are entirely absent, yet rarely (in Cuban specimens) they are well developed. The cephalic spines are small, as in *D. penalea*. Commonly the first two connexival segments bear spines; sometimes the third is acutely prominent but is never distinctly spined. Hemelytra of the males usually reach only to the apical third of the seventh tergite, but sometimes they attain or barely surpass the abdominal apex. In females too the hemelytra fail to reach the base of the eighth tergite; and since the eighth segment (Fig. 9) is more narrowly elongate than in other species, the females of *interjungens* have a distinctive habitus which is approached only by females of *D. bicarinata*.

Bergroth described *Doldina praetermissa* from two female specimens, flatly refusing to name either of them as type. One of his cotypes, from British Honduras, has not been located. The other, which was listed first under the description, was from Charlotte Harbor, Florida. Mrs. Slosson gave this specimen many years ago to Mr. H. G. Barber, according to information received from him, and it is now deposited in the U. S. National Museum. We hereby designate it the lectotype of *Doldina praetermissa* Bergroth.

The only differential character given by Bergroth to separate his two species was the presence of supra-humeral spines in *interjungens* and their absence in *praetermissa*, but Barber (1923) noted that this character did not hold good in topotypic specimens of *praetermissa* collected by Mrs. Slosson. We cannot find that two distinct species of *Doldina* occur in the United States, and agree with Blatchley that *praetermissa* should be placed as synonymous with *interjungens*.

We have considered the possibility that Bergroth, when describing *praetermissa*, had females of two species before him, the one from Belize perhaps being referable to the common Honduranian *D. penalea*, just described above. But *D. interjungens* also occurs in Honduras; and the females of these two species are so different in habitus that a hemipterist of Bergroth's wide experience would surely have recognized *penalea* as distinct from the species occurring in Florida.



Through the courtesy of Ing. F. Valdes Barry we have seen the two female specimens standing as *D. armata* (F. & B.) in the collection of the Estación Experimental Agronómica at Santiago de las Vegas. They were collected several years after the species was described, and were among the specimens reported by Bruner and Barber (1937) when they synonymized *armata* with *interjungens*. As noted by these authors, the supra-humeral spines are much better developed in these Cuban examples than in any we have seen from North America, but they alone are not sufficient to warrant recognition of a Cuban species distinct from *interjungens*.

*Male*. Median process of hypopygial margin (Fig. 8) much wider than in any other species, most commonly broadly triangular as seen from behind, rarely with sides less strongly convergent on basal than on apical half. Claspers very slender, long, distinctly surpassing median hypopygial process when seen from side.

*Female*. Eighth tergite (Fig. 9) little more than one-third wider at base (including connexivum) than its median length, apex produced somewhat beyond base of pygidium; apex of abdomen quite pilose, hairs partly concealing the oblique pygidium whose tip is only slightly caudad of apex of eighth tergite.

The specimens we have seen are from the following localities:

FLORIDA: Manatee, Cortez Beach, Paradise Key (Royal Palm Hammock), Cape Sable, Ocala National Forest in Marion County, Leesburg, and Cedar Key (Univ. Mich. Mus.); Fort Myers, Fort Lauderdale, Palm Beach, and Paradise Key (U.S.N.M.); Key Largo and Martin County (Fla. Plant Board); Enterprise and Biscayne (Cornell Univ., ex Heidemann); Dunedin and Atlantic Beach (Calif. Acad. Sci., ex Van Duzee); Lutz (Hillsborough County) (Carnegie Mus.).

GEORGIA: Tybee (Calif. Acad. Sci.); Tybee Island (Cornell Univ.).

LOUISIANA: Lake Charles (Univ. Mich. Mus.); Baton Rouge (Elkins coll.).

TEXAS: Galveston and other Gulf coast localities; Huntsville (Elkins coll.).

HONDURAS: Without definite locality, intercepted at New Orleans (U.S.N.M.).

CUBA: Santiago de las Vegas, Habana Prov., and Jaronú, Camagüey Prov. (Estac. Exp. Agr. Cuba).

ISLE OF PINES: Nueva Gerona, on lemon (U.S.N.M.).



Key to the Species of *Doldina* Stal

1. Distinct spines present on apical angles of all connexival segments (5 in male, 6 in female) ..... 2
- Distinct spines present on not more than three proximal segments of connexivum ..... 3
2. Head about one-sixth shorter than pronotum; first antennal segment subequal to or slightly shorter than head and pronotum combined; male pygidium produced behind as a narrow, short, obtusely pointed process ..... *cubana* Barber and Bruner
- Head as long as or slightly longer than pronotum; first antennal segment as long as or longer than head, pronotum, and scutellum combined; postero-lateral submargins of pronotum very plainly depressed below margins, posterior angles lightly produced backward as small lobules; male pygidium seen from below (Fig. 1) obovate, without a short, narrow apical process ..... *bicarinata* Stal
3. Hind lobe of pronotum either distinctly 4-spined, or with a supra-humeral spine (usually well developed) or spinule plus a small spine or tubercle <sup>4</sup> each side on disk ..... 4
- Hind lobe of pronotum either wholly unarmed, or with a small supra-humeral spine or tubercle only, the disk unarmed .... 5
4. Membrane, connexivum, and hind femora without fuscous spots; first three connexival segments spinose; post-antennal spines at least half as long as vertical height of an eye; discal spines of pronotum most commonly well developed, seldom much shorter than lateral ones and most rarely reduced to small tubercles; postero-lateral submargins of pronotum depressed below the sub-callose margin, posterior angles produced backward as small lobules (slightly larger than in *bicarinata*) ..... *carinulata* Stal
- Closed cells of membrane with numerous fuscous spots and dashes, hind femora lightly spotted with fuscous, connexival segments above and below with a blackish spot in apical angles; a small piceous digitiform spinule on first connexival segment only; post-antennal spines very small; lateral spines of pronotum minute, discal spines (always?) reduced to small

<sup>4</sup> Not infrequently one or both discal spines may be broken off close to the pronotum, so that the remaining basal portion appears like a small tubercle. If supra-humeral spines are broken, this usually occurs farther from their bases.



tubercles not higher than their own diameter .....  
 ..... *limera* new species

5. Front femora, seen from above, with light but distinct bisinuous lateral curvature; larger species, more robust, more than 18.5 mm. long, pronotum about one-tenth longer than wide, its posterior and postero-lateral margins lightly sinuate .....  
 ..... *lauta* (Stal)

Front femora straight; smaller, more slender species, usually less than 18 mm. long, pronotum at least one-fourth longer than wide, its posterior and postero-lateral margins straight or virtually so ..... 6

6. Meso- and metapleura concolorous, not striped with fuscous, front lobe of pronotum commonly embrowned toward sides above; first antennal segment, legs, and sides of head with rather dense, long, silvery or concolorous pilosity; pronotum wholly unarmed; hemelytra very nearly (♀) or quite (♂) attaining apex of abdomen ..... *penalea* new species

Meso- and metapleura with a broad dark-brown vitta, often extended back onto sides of abdomen and sometimes also (in darkest specimens) forward on sides of head below eyes; antennae, legs, and sides of head more shortly and less densely pilose; pronotum without discal spines, the supra-humeral pair sometimes absent, rarely well developed, most commonly present as minute, usually concolorous spinules; hemelytra most rarely (in some males only) surpassing apex of seventh tergite ..... *interjungens* Bergroth

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<sup>5</sup> Stal himself and most later writers have given 1860 as the date of this publication. The copy before us, with the original paper cover bound in, bears the date 1862. Perhaps separates were issued in 1860, but under the *Règles* this would not constitute publication.





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