The Nearctic species of the genus *Duta* are revised. Two new species are described: *D. foveolata* (Canada, USA) and *D. policeps* (Canada, USA). *Duta virginiensis* (Ashmead), new combination, is shown to be widely distributed in the Western Hemisphere, extending to the New World tropics. A diagnosis of *Duta* and a key to the Nearctic species are given. The impact of environmental degradation on the frequency of *Duta* species in North America is discussed.

**INTRODUCTION**

The name *Duta* was proposed by Nixon (1933) for *Holoteleia tenuicornis* Dodd, an Oriental species. Nixon also described a new subspecies of *D. tenuicornis* from South Africa. Szabó (1957, 1966) described one species from Europe and two species from Argentina. Mineo (1979) treated *D. longimarginata* Szabó as a junior synonym of *D. tenuicornis*. Galloway (1976) transferred two Australian species from *Leptoteleia* Kieffer to *Duta*. Masner (1976) summarized the world distribution of *Duta*, gave a new generic diagnosis, and discussed the synonymy and relationships. Muesebeck (1979) reported, without names, several species of *Duta* from America north of Mexico. Galloway and Austin (1984) revised *Duta* in Australia, recognizing four species.

Until very recently (Muesebeck 1979) the genus *Duta* was not properly recognized in North America. The only described species, *D. virginiensis* (Ashmead), was previously placed in *Anteris* Foerster (Ashmead 1893), in *Prosanteris* Kieffer (Kieffer 1926; Muesebeck and Walkley 1951), in *Ceratoteleia* Kieffer (Muesebeck 1958), or in *Calotelea* Westwood (Muesebeck and Masner 1967; Masner and Muesebeck 1968). Kozlov (1970) and Masner (1976) placed *Duta* in the tribe Psilanteridini of the subfamily Scelioninae. In North America the members of *Duta* may be distinguished from *Holoteleia* Kieffer and *Harringtonia* Masner principally by the presence of a skaphion, from *Spiniteleia* Masner by the unarmed scutellum, and from *Opisthacantha* Ashmead by the unarmed metanotum. In contrast to some Nearctic species of *Holoteleia* all three Nearctic species of *Duta* have wings fully developed, reaching to or surpassing the tip of the metasoma.

The geographic distribution of *Duta* is nearly worldwide with only the Chilean and New Zealand subregions without recorded species (Masner 1976). The centre of diversity is in both the New and Old World tropics, but only a fragment of this fauna has been described. A few species have penetrated into temperate zones. The three Nearctic species are widely distributed in the eastern part of the continent (cf. Figs. 1–3) with only a few
individuals recorded west of the Mississippi River and with no records west of the Rocky Mountains and none from the boreal or arctic part of North America. This pattern corresponds in principle with the geographic distribution of ground crickets (Gryllidae, Nemobiinae) in North America (Daniel Otte, personal communication).

The biology and behaviour of species of *Duta* are little known. The wasps are presumed to attack eggs of various ground crickets (Gryllidae, Nemobiinae) with one wasp hatching from an egg. Even though no Nearctic species has been reared from eggs of ground crickets, all three species were frequently caught in pan traps together with nymphal or adult ground crickets especially during the late summer and fall. I also examined an undescribed Oriental species of *Duta* reared from the egg of a ground cricket. Severin (1935) described the biology of a closely related scelionid wasp, *Calliscelio marlattii* (Ashmead), an egg parasitoid of *Gryllus assimilis* Fabricius, a serious pest of agricultural crops in South Dakota. Up to 50% of all eggs of the pest were reportedly parasitized by the wasp. Adults of *Duta* are encountered in both open and forest habitats, in grasslands, on the ground, among herbaceous plants, and occasionally also in detritus. Pan trapping is the most productive collecting method. The three Nearctic species have a distinct late summer – early autumnal peak of frequency.

All three species were frequent in pan traps, sweep samples, and to a lesser degree in Malaise traps over the period of 2 decades of my exploration of North America (1970–1990). However, a steady decline in frequencies in all three species, especially in the past 5 years, may indicate a serious environmental problem. Traps operated in 10 locations around Ottawa, Ontario, and representing at least four major ecosystems (grassland, forest, marsh, sands) yielded gradually fewer individuals of *Duta*. A near total crash in populations occurred in 1989–1990. A similar decline in the frequencies, with several cases of possible extirpation, was monitored on 48 other species of local scelionid wasps with hosts which develop on or in the soil; thousands of specimens were examined. The severe reduction in populations of these species may be attributed to major physical or chemical changes in the soil such as the increased acidity due to aerial pollution. It is interesting to note that in Europe species of *Duta* and other ground scelionids, that occupy the same soil niche, were already very rare before and during the previous decades of my work in Central Europe (1948–1968). The advanced environmental destruction in Europe is a possible explanation of this phenomenon.

Almost all of the 1089 specimens of *Duta* examined in this study are deposited in the Canadian National Collection (CNCI) and were collected in the past 2 decades. In a few exceptional cases the deposition of specimens other than in the CNCI is clearly stated.

**DUTA NIXON**

*Holoteleia* sensu Dodd (nec Kieffer), 1920. *Trans. ent. Soc. Lond.* 1919: 335.

*Duta* Nixon, 1933. *Ann. Mag. Nat. Hist.* ser. 10, 12: 306. Type-species: *Holoteleia tenuicornis* Dodd. By monotypy and original designation.

*Chaetanteris* Priesner, 1951. *Bull. Inst. Fouad I du Desert* 1: 136. Type-species: *Chaetanteris serraticeps* Priesner. By monotypy and original designation. Synonymized by Masner, 1976.

**Diagnosis** (*♀♂*). Mostly small-size (length 1.4–1.7 mm) light brown to yellow, slender habitus; head in dorsal view transverse, moderately to distinctly wider than long, subelliptical; eyes large, pubescent; lateral ocellus contiguous with inner orbit or distant by no more than one diameter; occipital carina well developed, usually crenulate; frons slightly convex, without depression; cheeks and frons above malar sulcus not striate; malar sulcus well developed; clypeus truncate; labrum exposed, sclerotized; mandibles tridentate, with teeth subequal; palpal formula 4-2; antennal formula 12-12, antenna with 6-segmented
clava and sensillar formula 1-2-2-2-1-0 in female, thread-like in male, with antennomere 5 modified (sex segment).

Mesosoma in dorsal view longer than wide; skaphion well developed; notaulus perpendicular; transscutal suture with foveolae at side, deep at meson; scutellar disc convex, unarmed; dorsellum unarmed, with smooth ventral lip; propodeum unarmed, considerably reduced medially; mesosoma in lateral view with netrion well developed; mesopleural carina complete; fore wing with submarginal vein adjacent to fore margin of wing, with erect bristles along its length; marginal vein either shorter or longer than stigmal vein, always shorter than postmarginal vein; basal vein absent or nebulose in some species; hind wing with distinct and complete submarginal vein; legs slender, with tarsal formula 5-5-5.

Metasoma elongate, spindle-like, narrowed at base; laterotergites narrow, submarginal ridge well impressed; T1 and T2 with longitudinal costae, T1 in female without hump or horn; T3 largest segment of metasoma, smooth; female T6 subtriangular, not attenuate, T7 attached to and extruded with ovipositor.

**KEY TO DUTA SPECIES OF AMERICA NORTH OF MEXICO**

1. Mesopleural carina flanked ventrally by row of deep foveolae (Fig. 16); humeral and suprhumeral sulci foveolate (Fig. 15); cervical part of pronotum foveolate (Fig. 15) ........................................... *D. foveolata* sp. nov. ♂ ♂

— Mesopleural carina without foveolae ventrally (Figs. 17, 18); humeral and suprhemeral sulci not foveolate (Figs. 17, 18); cervical part of pronotum not foveolate .............................................. 2

2. Upper frons, ocellar triangle, and most of vertex smooth, small patch of fine coriaceous sculpture behind posterior ocellus (Fig. 8); vertex in lateral view with long semierect hairs (Fig. 7); marginal vein in fore wing distinctly longer than stigmal vein (Fig. 10); frons above interantennal process without keel ........................................... *D. policeps* sp. nov. ♂ ♂

— Upper frons (especially along inner orbits), ocellar triangle, with entire vertex and occiput coriaceous; vertex in lateral view with only short semidecumbent hairs (Fig. 6); marginal vein in fore wing distinctly shorter than stigmal vein (Fig. 11); frons above interantennal process with fine keel ........................................... *D. virginiensis* (Ashmead) ♂ ♂

*Duta foveolata* sp. nov.

(Figs. 1, 9, 12, 15, 16)

**Diagnosis and Recognition** (♂ ♂). Ocellar triangle low; mesopleural carina flanked ventrally by a row of deep foveolae; cervical part of pronotum foveolate; humeral and suprhemeral sulci foveolate. *Duta foveolata* is unique among all known species of *Duta* in having the mesopleural carina flanked ventrally by a row of foveolae and differs from *D. policeps* and *D. virginiensis* in having the cervical part of the pronotum foveolate, and the humeral and suprhemeral sulci foveolate.

**Description. Female** (Holotype). Length 1.7 mm. Colour light chestnut brown; head dark brown to black, side of pronotum and pleura yellowish-brown; T1 golden brown, mandible (except darker tips), palpi, labrum, radicle, and base of A1 yellow; upper half of A1 light brown, A2–A12 dark brown to black; legs including coxae bright yellow; wings clear.

Head in dorsal view strongly transverse, distinctly wider than long (45:26), with short decumbent hairs on occipit; occipital carina finely but distinctly crenulate; occiput and vertex roughly coriaceous, coriaceous sculpture continuing along inner orbits, becoming indistinct in front of anterior ocellus; ocellar triangle low (POL:LOL = 14:7), OOL shorter than 1/2 ocellar diameter; eye large, distinctly hairy; temple vary narrow, strongly receding; head in lateral view higher than long (44:26); eye height: malar space (26:11); postgena smooth; hairs on vertex short, semidecumbent, slightly exceeding top of anterior ocellus; head in frontal view subcircular; frons between interantennal process and anterior ocellus smooth, predominantly glabrous with only few, scattered, setigerous punctures in
upper half, with narrow strip of fine, coriaceous sculpture along inner orbit, with no keel above interantennal process but with indistinct, low bulge instead, and with several, delicate, longitudinal wrinkles lateral to inner rim of antennal socket; clypeus truncate with sharp ventral rim; labrum exposed, sclerotized; malar sulcus deep, slightly widened in lower half; mandible tridentate with upper tooth longest; antenna (Fig. 12) with relative proportions of antennomeres (32:5.5), (7:4), (10:4.5), (8.5:4.5), (5:4), (3:5), (4:6), (5:8), (5.5:9), (5:8), (7:7).

Mesosoma in dorsal view longer than wide (50:40); cervical part of pronotum distinctly foveolate; skaphion smooth and glabrous; mesoscutum with dense coriaceous sculpture and dense decumbent pilosity, sculpture becoming finer to indistinct in front of transscutal suture on posterior margin of midlobe; notaulus deep and broad, percurrent; humeral and suprahuemeral sulci deep, distinctly foveolate (Fig. 15); scutellum anterolaterally with 4 major foveolae and with very broad and deep transscutal suture mediately, anterior half of scutellum with fine, coriaceous sculpture, posterior half smooth, posterior margin of scutellum (in front of scutellar rim) distinctly foveolate; ventral lip of dorsellum narrow, smooth; propodeum mediately very narrow but still developed, propodeum at sides smooth mediately, with deep foveolae along posterior margin; mesosoma in lateral view convex, slightly longer than high (50:43); side of pronotum predominantly smooth and glabrous, with distinct row of foveolae along upper margin between tegula and cervix with circular patch of fine, dense sculpture in front of spiracle and with irregular sculpture along anterior margin; metantron deeply foveolate along anterior margin, foveolae as large as one-half width of metantron; mesopleural depression smooth and glabrous; mesopleural carina complete, sharp, flanked ventrally by row of deep foveolae (Fig. 16); mesepisternum below mesopleural carina with a few scattered hairs and with delicate patch of microcoriaceous sculpture near acatabular carina; mesepimeron divided from mesepisternum by row of deep foveolae; acatabular carina crenulate ventrally; metapleuron smooth and glabrous with row of foveolae along anterior margin and with deep sulcus dorsomedially, sulcus foveolate in upper half; fore wing (Fig. 9) relatively short and narrow, not exceeding tip of metasoma, with 8–9 long, semierect bristles on submarginal vein, marginal vein moderately elongate but shorter than stigmal vein (7:10); stigmal vein considerably slanted, postmarginal vein long, clearly defined, distinctly longer than marginal vein (25:7); basal and median veins nonpigmented, spectral.

Metasoma in dorsal view longer than wide (97:45); T1 wider than long (20:12), with strong longitudinal costae; T2 wider than long (40:20), with strong longitudinal costae in anterior two-thirds, rest of tergite smooth with scattered hairs at sides; T3 slightly wider than long (45:35), predominantly smooth and glabrous, with small patch of microcoriaceous sculpture in posterolateral corner and with narrow zone of hairs laterally; T4–T6 with delicate microcoriaceous sculpture and scattered pilosity all over.

**Male** (Allotype). Differs from female as follows: Antenna thread-like, with relative proportions of antennomeres (27:5), (6:4), (11:4), (10:4), (11:5), (10:4), (10:4), (9.5:4), (9.5:4), (9:4), (14:4); A2–A12 with dense hairs not exceeding half length of each antennomere; A5 with distinct keel reaching to basal half of antennomere; fore wing relatively larger than in female, distinctly exceeding apex of metasoma; microsculpture on T4 more delicate than on female.

**Type Material** (277 specimens, 9♂♀). HOLOTYPE ♀ (CNC No. 20856), Canada, Ontario, Nepean–Tanglewood, 25 August – 14 September 1978, pan trap, L. Masner; ALLOTYPE ♂ Canada, Ontario, Nepean, Tanglewood, 28 July – 9 August 1979, pan trap, L. Masner; PARATYPES: CANADA: Ontario: 31♂♀, Nepean, Tanglewood, 7 August – 2 October 1978–1981, pan trap; 18♂♀ Ottawa, 10 July – 18 August 1979–1988; ♀, Ottawa, 19 September 1986, H. Goulet; ♂, Ottawa, September 1970, A. Sauvē; 2♂♀, Ottawa, Mer Bleue, 11–18 August 1982, L. Masner; 15♂♀, Ottawa, Shirley’s
Bay, Innes Pt., 28 August – 3 September 1985, L. Dumouchel, pan trap; 3♂ 3♀, Stittsville, 13–17 August 1977 and 1–6 September 1977, Malaise trap, L. Masner, G. Gibson; 7♀ 2♂, Oxford Mills, 27 July – 21 August 1978, yellow pan trap, G. Gibson; 3♀ 1♀, Chaffey's Lock, bog 10 mi. W, 6 September 1980, S.B. Peck; 2♀ 2♂, Upper Rock Lake, 30 km N Kingston, July–August 1977, ex pitfall trap in sphagnum bog C.D. Dondale and J. Redner; 3♀ 2♂, 18 km E Gananoque, 24 August – 12 September 1977, C.D. Dondale and J. Redner; 2♂, Constance Bay, Carleton Co., 24 July 1983, M. Sanborne; 2♀, nr. Kemptville, 16–24 August 1983, Malaise trap, L. Dumouchel; 2♂ 3♀, Chatterton, 13 mi. N Belleville, meadow, 16 June 1967 and 1968, coll. C.D. Dondale; 3♀ 2♂, Fanshaw nr. London, 13–17 September 1982, A. Tomlin; 3♂, Hamilton, 18 August 1980, Malaise trap, M. Sanborne; 2♀, Marmora, 26 July 1951, among grass roots, J.R. Vockeroth; 3♀ 3♂, Crow Lake, Marmora area, 27 August 1959, L.K. Smith; Québec: 14♀ 3♂, Parc Gatineau, 23 August – 12 October 1969–1983, S. Clark, J. Denis, L. Masner; 2♀ 3♂, Older Chelsea, 10 August 1980 and 1971, L. Masner; 3♂ 2♀, Hull, 1–6 September 1983, flood forest, L. Dumouchel; 2♀, Ste. Cecile de Masham, 17–27 September 1984, pan trap, J. Denis; 15♀ 2♂, Lac Rodick (10 km N Bouchette), 23 July – 14 September 1978–1983, pan trap, L. Masner; 3♂ 2♀, Rigaud, 9 August 1979, flood forest, L. Masner and H. Gooulet; 3♂ 2♀, Mt. St. Hilaire, 9–30 August 1977, Malaise trap, A.T. Finnamore; 11♀ 2♂, Ste. Anne de Bellevue, Arboretum September 1979, M. Sharkey, pan trap. USA: Florida: 5♂ 3♀, Alachua Co., Gainesville, American Entomological Institute, 25 July – 14 September 1987, oak forest, BRC Hymenoptera Team; 2♀, Jacksonville, St. John's Bluff (T. Rossevelt Preserve), 13 October 1980, L. Masner and B. Bowen; Georgia: 3♂, Jekyll Is., 14 August 1980, L. Masner; Louisiana: 4♂ 3♀, Iberville Parish, 4 October 1980, pools along Atchafalaya River, L. Masner and B. Bowen; Maine: 2♀, Washington Co., 5 km E Wesley, Hwy 9 at E Machia Riv., 29 August 1984, M. Kaulbars; Maryland: 16♀ 3♂, Silver Springs, 11 July – 4 August 1980, pan trap, E.E. Grissell; 2♀, Princeton Co., Patuxent Res. Sta., 25 July – 6 August 1980, M. Schauff; Massachusetts: 5♂ 2♀, Middlesex Co., Lincoln, 7–24 September 1982, E.T. Armstrong; Missouri: 53♀ 2♂, Wayne Co., Williamsville, June–November 1987 and 1988, Malaise trap, J.T. Becker; 2♀ 2♂, McBain, 23 July 1975; New Hampshire: 2♀, Lee, 3 August 1969, pitfall tap, R.L. Bickle; New Mexico: 4♂, Torrance Co., 6 mi. SW Manzano, Red Canyon Camp, 7500′, 17–30 June 1979, Malaise trap, S.B. Peck; North Carolina: 2♀, Jackson Co., Whiteside Mt. nr. Highlands, 1600 m, 10 July – 13 September 1987, oak forest, J.T. Huber and BRC Hymenoptera Team; 3♀ 2♀, Northampton Co., 7 km S Jackson, August–September 1987, flight intercept trap, bald cypress swamp, BRC Hymenoptera Team; 2♂, McDowell Co., 37°00′N and 81°30′W, August–September 1987, BRC Hymenoptera Team; 40♀ 2♂, Brunswick Co., St. Rd. 1401, 2 mi. W of Bolivia, 20 September – 27 October 1981, pan trap, T. Nuhn (in collection of T. Nuhn, Washington, DC); 2♀, Tyrell Co., NW of Columbia, road 1209, field T-2, soybean, 30 August 1979, sweeping, E.K. Rawls (in coll. T. Nuhn, Washington, DC); 2♀, Tyrell Co., NE Lk. Phep, road 1118, field T-8, soybean, 30 August 1979, pitfall trap, L. Freeman (in coll. T. Nuhn, Washington, DC); 2♀, Chowan Co., cotton field, 15 August 1979, Kay Slades, d-vac (in coll. T. Nuhn, Washington, DC); Pennsylvania: 3♀ 1♂, Milton, 26 August 1981, J.R. Vockeroth; Tennessee: 2♀, Lexington, Natchez Trace S.P., 20–26 June 1972, Malaise trap, G. Heinrich.

Distribution (Fig. 1). Widespread eastern species, from Québec to Northern Florida and west to Missouri and Louisiana. Single male (isolated dot on the map) from New Mexico. There are no records in Florida south of Gainesville.

Biology. Host and habits unknown. Most individuals were caught in pan traps.

Variation. Very little variability except for slight changes in shade of body colour.
Remarks. Crenulation on pronotal cervix, on humeral and suprahumeral sulci should be observed in diagonal view (angle of 45°).

**Duta policeps sp.nov.**

*(Figs. 2, 7, 8, 10, 14, 17)*

**Diagnosis and Recognition** (♀ ♂). Upper frons, ocellar triangle, and most of vertex smooth, small patch of fine coriaceous sculpture behind posterior ocellus; vertex in lateral view with semierect hairs; marginal vein in fore wing distinctly longer than stigmal vein; frons above interantennal process without keel. *Duta policeps* can be distinguished from both *D. foveolata* and *D. virginiensis* by the smooth vertex in the ocellar triangle and by having the longest marginal vein of all three Nearctic species. From *D. foveolata* it also differs by the lack of foveolae under the mesopleural carina and nonfoveolate humeral and suprahumeral sulci. From *D. virginiensis* it also differs by the absence of a keel above the interantennal process and by the distinctly semierect hairs on the vertex (lateral view).

**Description. Female** (Holotype). Length 1.6 mm. Colour light chestnut brown; head and A3–A12 dark brown to black; scutellum, T2 posteriorly, T3–T7 brown; pronotum, skaphion, mesoscutum, T1, T2 anteriorly, S1, S2 anteriorly, and side of pronotum yellowish brown; radicle, mandibles, palpi, anterior half of A1, and legs including coxae bright yellow; wings clear.

Head in dorsal view moderately transverse, wider than long (40:26), with long, scattered, semierect hairs on occiput, vertex, and upper frons; occipital carina with extremely fine crenulae; occiput smooth except small patch of fine, coriaceous sculpture behind posterior ocellus (Fig. 8); vertex including ocellar triangle smooth; frons smooth; ocellar triangle low (POL:LOL = 13.7), OOL slightly shorter than 1 ocellar diameter; eye large, distinctly hairy; temple moderately developed, strongly receding; head in lateral view higher than long (38:26); eye height: malar space (23:10); postgena smooth; hairs on vertex semierect at approximate 60° angle, distinctly exceeding level of anterior ocellus (Fig. 7); head in frontal view subcircular; frons smooth, highly polished, and mostly glabrous, with a few, long, scattered, semierect hairs in upper third and with 1 row of setigerous punctures along inner orbits, also with extremely narrow strip of microcoriaceous sculpture along upper inner orbit, with no keel above interantennal process and only indistinct bulge; clypeus truncate; labrum exposed, sclerotized; malar sulcus deep; mandible tridentate with upper tooth longest; antenna (Fig. 14) with antennomeres in relative proportion (27:5.5), (8:4), (10:4.5), (8.5:4.5), (5:4), (3:4), (4:6), (4.5:7), (5:8), (5:8), (5.5:8), (7:6).

Mesosoma in dorsal view longer than wide (50:35); cervical part of pronotum not foveolate; skaphion smooth and glabrous; mesoscutum with dense, decumbent pilosity, midlobe with delicate coriaceous sculpture becoming almost smooth posteriorly (in front of scutellum), lateral lobe of mesoscutum predominantly smooth; notaulus deep, broad percurrent; humeral and suprahumeral sulci deep, not foveolate; scutellum anterolaterally with 3 major foveolae and deep transscutal suture medially, with long, scattered, semidecumbent hairs, smooth and polished except for few setigerous punctures in anterior half; posterior margin of scutellum (in front of scutellar rim) foveolate; ventral lip of dorsellum wide, smooth; propodeum medially notched, posterior margin of propodeum blade-like carinate with posterolateral corners sharply pointed; mesosoma in lateral view (Fig. 17) convex, slightly longer than high (50:44); side of pronotum partly smooth, with upper margin between tegula and cervix not distinctly foveolate, with small patch of microcoriaceous sculpture in front of spiracle; netrion foveolate along anterior margin, foveolae smaller than half of netrion width, gradually diminishing upward; mesopleural depression smooth and glabrous; mesopleural carina complete, sharp, with no foveolae ventrally; mesepisternum below mesopleural carina with a few, scattered hairs, smooth, with minute
patch of microcoriaceous sculpture near acetabular carina; acetabular carina crenulate ventrally; meseopimeron divided from meseopisternum by deep row of foveolae; metapleuron smooth and glabrous, with row of foveolae along anterior margin and with deep, nonfoveolate sulcus dorsomedially; fore wing (Fig. 10) relatively short, slightly exceeding tip of metasoma with 8–9 semierect bristles on submarginal vein, marginal vein distinctly elongate, and longer than stigmal vein (12:7), postmarginal vein long, clearly defined, longer than marginal vein (20:12); basal and median veins weakly pigmented, almost indistinct.

Metasoma in dorsal view longer than wide (85:39); T1 only slightly wider than long (17:14), with strong longitudinal costae and with 4 long erect bristles at side; T2 wider than long (45:20) with strong longitudinal costae in anterior three-quarters; rest of tergite smooth with a few long scattered hairs at sides; T3 slightly wider than long (39:32), smooth and glabrous, with only a few, short hairs along side and with patch of only 3 cells of microcoriaceous sculpture posterolaterally; T4 smooth with only a few, short hairs; T5–T7 smooth with fine, setigerous punctures and denser pilosity particularly at sides.

**Male** (Allotype). Differs from female as follows: Distinctly darker, with head, most of mesosoma, and metasoma dark brown to black, with only T1 and anterior margin of T2 yellowish-brown; patches of coriaceous sculpture behind ocelli confluent medially; skaphion with irregular fine sculpture; coriaceous sculpture of middle lobe of mesoscutum better developed than in female; posterolateral corners of propodeum less projecting than in female; T1 more elongate, as long as wide (15:15); fore wing slightly larger than in female, with basal vein more pigmented; antennomeres in relative proportions (20:4.5), (5:4), (9:4.5), (9.5:4.5), (8.5:4.5), (8.4:5), (7.5:4.5), (7.5:4.5), (7:4), (12:4); A2–A12 with dense, semierect hairs reaching about 1.2 width of antennomeres; A5 with distinct keel reaching to basal two-thirds of antennomere.

**Type Material** (106 specimens, ♂♀). **HOLOTYPE ♂ (CNC No. 20857), Canada, Québec, Gatineau Park Ridge Road, 300 m, 7 August 1982, L. Masner, sweeping; ALLOTYPE ♂, Canada, Québec, Gatineau Park, 18 July 1979, L. Masner, sweeping; PARATYPE: CANADA: **Ontario:** ♀, Nepean, Tanglewood, August–September 1981, L. Masner, pan trap; ♀, Nepean, Pineglen, 15–20 August 1989, L. Masner, flight intercept trap; ♀, Ottawa, 10–26 July 1979, L. Masner; ♀, Ottawa, 29 July 1975, L. Masner; ♀, Ottawa 15 August 1974, L. Masner; 2♂♂, Ottawa, 10–17 July 1979, L. Masner; ♀, Ottawa, 29 July 1975, L. Masner; ♀, Stittsville, D. Brown’s farm, 1–6 September 1977, L. Masner, G. Gibson, Malaise trap; 2♀♀, Ottawa, Innes Point, 28 August 1981, H. Goulet; ♀, Ottawa Airport, 13–20 August 1985, L. Dumouchel, pan trap; ♀♂, Ottawa, Mer Bleue, 20 June 1982, L. LeSage, ex muskrat nest; ♀, Ottawa, Mer Bleue, 16 August 1983, flight intercept trap; ♀, Ottawa, Mer Bleue, 11–18 August 1982, L. Masner; 3♀♀, Ottawa, Mer Bleue, 16–22 August 1982, H. Goulet; ♀, Alfred, Alfred Bog, 14 October 1984, M. Sanborne; 2♂♂, Alfred, Alfred Bog, 15–30 August 1984, M. Sanborne; ♀, Alfred, Alfred Bog, 3 August 1984, M. Sanborne; ♀, Kemptville, Flint Hill, 13 September 1983, L. Dumouchel, Malaise trap; ♀, Kemptville, Flint Hill, 6 September 1983, L. Dumouchel; 2♀♀, Kemptville, Flint Hill, 16–24 August 1983, L. Dumouchel, Malaise trap; ♀, Kemptville, Flint Hill, 16 August 1983, L. Dumouchel and J. Perkins, Malaise trap, sunny deciduous forest; ♀, Kemptville, Flint Hill, 27 September – 4 October 1983, J. Denis, pan trap; ♀, 10 km W of North Gower, 2 July 1987, A. Davies, Berlese; 2♂♂, Spencerville, 17 August 1979, L. Masner and H. Goulet, flood forest; ♀, Spencerville, 15–27 September 1979, L. Masner; ♀, Spencerville, 28 September – 1 October 1979, L. Masner, pan trap; ♀, Oxford Mills, 21 August 1978, G. Gibson, yellow pan trap; ♀, Oxford Mills, 8 August 1984, L. Masner; ♀, Oxford Mills, 15 August 1984, L. Masner; 4♂♂, Oxford Mills, 17 August 1978, G. Gibson, yellow pan trap; ♀, Constance Bay, 25 September 1982, L. Masner; ♀, Chaffey’s Locks, 2 August 1974, I. Smith, beech litter from shore of Lake
Distribution (Fig. 2). Widespread eastern species, from Québec to southern tip of Florida (Everglades National Park), not yet recorded on the western side of the Appalachian chain. Three isolated dots on the map from southern New Mexico and Arizona.

Biology. Host and habits unknown. *Duta policeps* appears to be a generalist occurring in a variety of habitats (forest, grassland, swamp).

Variation. The only significant variation appears to be in the extent of the two coriaceous patches behind the posterior ocelli. In some individuals the patches were slightly larger than in the type, nearly to completely confluent.

Remarks. The semierect bristles on the vertex may be damaged (broken) in some individuals, or decumbent due to body oil, or in generally dirty condition.

**Duta virginiensis** (Ashmead), new combination

(Figs. 3–6, 11, 13, 18)

*Anteris virginiensis* Ashmead 1893, Bull. U.S. natn. Mus. 45: 225, 226. ♀. Type in USNM; examined.

*Anteris virginicus* (!): Ashmead 1893, Bull. U.S. natn. Mus. 45: 465. Error.

*Prosanteris virginiensis*: Kieffer 1926, Das Tierreich 48: 438.

*Prosanteris virginiensis*: Muesebeck and Walkley 1951, in Muesebeck et al. Hymenoptera of America North of Mexico. Agric. Monogr. 2: 704.

*Ceratoteleia virginiensis*: Muesebeck 1958, in Krombein, Hymenoptera of America North of Mexico, Agric. Monogr. 2: 298, Second Supplement.
Calotelea virginiensis: Masner and Muesebeck 1968, Bull. U.S. natn. Mus. 270: 33.
Calotelea virginiensis: Muesebeck 1979, in Krombein et al., Catalog of Hymenoptera in America North of Mexico, 1: 1155.

**Diagnosis and Recognition** (♀ ♂). Ocellar triangle higher POL:LOL = 9:6; frons above interantennal process with fine keel; upper frons, ocellar triangle, entire vertex, and occipit coriaceous; vertex in lateral view with only short semidecumbent hairs; marginal vein in fore wing distinctly shorter than stigmal vein. *Duta virginiensis* can be distinguished from *D. foveolata* by the absence of foveolae below the mesopleural carina as well as by the nonfoveolate humeral and suprahumeral sulci. From *D. policeps* it differs by the sculpture of the head and by a short marginal vein in the fore wing.

**Description. Female** (Voucher). Length 1.4 mm. Colour dark chestnut brown; head and antennal clava darker than rest of body, almost black; side of pronotum and posterior half of T1 and entire S1 as well as base of S2 yellowish-brown; mandibles; palpi, radicle, basal two-thirds of A1, and legs including coxae bright yellow; fore wing slightly infuscate.

Head in dorsal view moderately transverse, slightly wider than long (41:25), with short, dense, semidecumbent hairs on occiput, vertex, and upper frons; occipital carina finely crenulate; occiput, vertex, and upper frons coriaceous, coriaceous sculpture continuing along inner orbits, becoming indistinct in front of anterior ocellus; ocellar triangle high (POL:LOL = 9:6), posterior ocellus contiguous with inner orbit; eye large, distinctly hairy; temple very narrow, strongly receding; head in lateral view higher than long (40:25); eye height : malar space (25:11); postgena smooth, with scattered decumbent hairs; hairs on vertex short, only slightly exceeding top of anterior ocellus (Fig. 6); head in frontal view subcircular; frons between interantennal process and anterior ocellus predominantly smooth and glabrous, with dense, semidecumbent hairs in upper part, with narrow strip of fine coriaceous sculpture along inner orbit, with fine but distinct keel above interantennal process, keel reaching almost to half of frons; clypeus truncate, labrum exposed; malar sulcus deep but not widened basally; mandible tridentate, teeth subequal; antenna (Fig. 13) with relative proportions of antennomeres (25:5), (6.5:4), (8.5:4.5), (6:4.5), (4.5:4), (2.5:3.5), (3.5:5.5), (5:6.5), (5:5.8), (5:8), (5:7), (5:5.6).

Mesosoma in dorsal view slightly longer than wide (45:40); cervical part of pronotum nonfoveolate; skaphion smooth and glabrous, with 2 shallow, parallel longitudinal lines medially and with few delicate transverse wrinkles between 2 lines; entire mesocutum with dense, coriaceous sculpture and dense decumbent pilosity; notaulus deep but fine, percurrent; humeral and suprahumeral sulci deep, nonfoveolate; scutellum anteriorly with 4 major foveolae and a broad deep transscutal suture medially; anterior third of scutellum with fine, coriaceous sculpture, posterior part smooth with long, semidecumbent, scattered hairs, posterior margin of scutellum (in front of scutellar rim) distinctly foveolate; ventral lip of dorsellum broad, smooth; propodeum medially in dorsal view almost concealed under lower margin of dorsellar lip, propodeum at sides (posterior to spiracle) partly smooth, with posterolateral corners moderately projecting; mesosoma in lateral view (Fig. 18) highly convex, slightly longer than high (40:45); side of pronotum partly smooth and glabrous, with row of irregular foveolae along upper margin between tegula and cervix, with circular patch of fine dense sculpture; netrion with fine foveolae along anterior margin, foveolae as large as 1/3 width of netrion; mesopleural depression smooth and glabrous; mesopleural carina complete, sharp, without foveolae ventrally; row of fine foveolae connecting acetabular carina with anterior end of mesopleural carina; mesepisternum below mesopleural carina with few scattered hairs and with delicate patch of microcoriaceous sculpture near acetabular carina; acetabular carina crenulate ventrally; mesepimeron divided from mesepisternum by row of deep foveolae; metapleuron smooth and glabrous, with row of minute foveolae along anterior margin and with deep sulcus dorsomedially, sulcus foveolate only in upper extreme part; fore wing (Fig. 11) relatively
long and broad, exceeding tip of metasoma, with 11–12 long semierect bristles on submarginal vein, marginal vein moderately elongate but shorter than stigmal vein (5:9), stigmal vein only moderately slanted, with large apical knob, postmarginal vein long, not clearly defined apically, distinctly longer than marginal vein (20:5); basal vein considerably pigmented, nebulous, median vein spectral.

Metasoma in dorsal view longer than wide (70:36); T1 wider than long (15:11), with strong longitudinal costae; T2 wider than long (35:17), with strong longitudinal costae in anterior three-quarters, rest of tergite smooth with scattered hairs at sides; T3 wider than long (36:27), predominantly smooth and glabrous, with extremely small patch of microcoriaceous sculpture in posterolateral corner and with scattered, semidecumbent hairs posterolaterally; T4–T7 combined only slightly shorter than T3 (25:27), with dense, fine, coriaceous sculpture and dense pilosity all over.

**Male** (Homotype). Differs from female as follows: Antenna thread-like with relative proportions of antennomeres (19:4.5), (5:4), (7:4.5), (6:4.5), (6:4), (6.5:4), (6.5:4), (6.5:4), (6.5:4), (7:4), (7:4), (11:4); eyes relatively smaller, OOL slightly more than 0.5 diameter of lateral ocellus; fore wings distinctly surpassing tip of metasoma.

**Material Examined.** 655 specimens (♀♂) from Nearctic Region, 101 from Neotropical Region. Homotype ♂, Maryland, Calvert Co., 7 km S Prince Fredrick, August–September 1987, FIT in hardwood forest, BRC Hymenoptera Team; Voucher ♀, Maryland, Calvert Co., 7 km S Prince Fredrick, 29 September 1987, screen sweeping in hardwood forest, BRC Hymenoptera Team.

**Distribution** (Fig. 3). Canada, United States, Belize, Brazil, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Venezuela.

**Canada** (province, number of specimens): Ontario 233, Québec 74.

**USA** (state, number of specimens): Arizona 1, Florida 158, Georgia 10, Illinois 2, Louisiana 4, Maine 1, Maryland 58, Massachusetts 1, Michigan 1, Missouri 55, New York 1, North Carolina 7, South Carolina 8, Texas 34, Virginia 7.

**Biology.** Host and habits unknown. Adults occur in a variety of habitats, with peak of occurrence in summer and early fall.

**Variation.** The most conspicuous variation is in the overall shape of the female metasoma, especially in lateral view. Largely due to telescoping of the posterior segments (4–6), the metasoma past the large segment may appear shorter (majority of individuals) or longer. The chain of foveolae in the epicnemial region of the mesopleuron (between the acetabular carina and the mesopleural carina) may be incomplete. The body colour may vary between yellowish-brown to dark chestnut brown. Some southern individuals (e.g. Texas) may have the coriaceous sculpture on the frons extending more down toward toruli. Slight variations occur in the length:width ratio of the male flagellomeres and the keel of A5 may also attain varying length. The variability in *D. virginiensis* may be explained by its wide range of distribution (from Canada to Brazil).

**Remarks.** With respect to its wide distribution and high frequency of individuals in eastern North America, I pondered the possible occurrence of *D. virginiensis* in Europe. Unfortunately, the identity of the European *D. longimarginata* Szabó remains uncertain as the type is not available for examination. Mineo (1979) synonymized *D. longimarginata* with *D. tenuicornis* (Dodd) but Szabó’s (1957) description and illustration of the antenna of *D. longimarginata* would contradict the above synonymy.

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Fig. 1. Distribution of *Duta foveolata* sp. nov. (isolated dot in New Mexico).
FIG. 2. Distribution of *Duta policeps* sp.nov. (isolated dots in New Mexico and Arizona).
Duta virginiensis (Ashmead)

Fig. 3. Distribution of *Duta virginiensis* (Ashm.) (isolated dots in Texas and Arizona).
Figs. 4–8. 4, *Duta virginiensis*♀, lateral view, with extruded ovipositor; 5, *D. virginiensis*♂, dorsal view, with extruded ovipositor; 6, *D. virginiensis*, head, lateral view; 7, *D. policeps*, head, lateral view; 8, *D. policeps*, head, dorsal view.
Figs. 9–14. 9, Duta foveolata, forewing; 10, D. policeps, forewing; 11, D. virginiensis, forewing; 12, D. foveolata ♂, antenna; 13, D. virginiensis ♂, antenna; 14, D. policeps ♂, antenna.
FIGS. 15–18. 15–16, *Duta foveolata*, scanning electron micrograph, mesosoma: 15, sk = skaphion; arrows = humeral and suprachumeral sulci; 16, arrows = foveolae under mesopleural carina. 17, *D. policeps*, scanning electron micrograph, mesosoma. 18, *D. virginiensis*, scanning electron micrograph, mesosoma.