

A KEY TO THE SPECIES OF *ECTEMNIUS* IN AMERICA NORTH
OF MEXICO WITH NOTES AND DESCRIPTION OF A NEW
SPECIES (HYMENOPTERA: SPHECIDAE)

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Abstract.—The 27 species of *Ectemnius* known from America north of Mexico are keyed and many of the structural characters are figured. Taxonomic notes on several of the species are presented along with one new species, **nigellus** Bohart from the western U.S. New synonyms are *proletarius*, placed under *borealis*; *yosemite* placed under *sexcinctus*, and *corrugatus*, *pauper*, *operus* and *drymocallidus*, placed under *atriceps*. A neotype is established for *trifasciatus* (Say).

Ectemnius is the second largest genus in the Crabroninae after *Crossocerus*. Some of its approximately 160 species are found in each of the zoological regions. In America north of Mexico 27 species are known. Discussions of the generic characters, subgenera and/or species groups, and species synonyms were given by LeClercq (1954) and Bohart (1976). Morphological features which when taken together separate *Ectemnius* from related genera are: Low ocellar triangle, well developed verticallus, trough shaped (usually) female pygidial plate, indistinct orbital foveae, evenly punctate upper frons, and recurrent vein joining submarginal cell beyond its distal third (rare exotic exceptions). In North America the only genera with which it might be confused are *Crabro*, which has the recurrent vein ending before the distal third of the submarginal cell; *Crossocerus* which has the ocellar triangle nearly equilateral; and *Lestica*, in which the orbital foveae are distinct and punctuation of the upper frons is irregularly coarse.

Ectemnius species vary considerably in markings, and a number of subspecies have been named as a result. The value of such names is questionable, even when there is some correlation with geography. Criteria for the more definitive varieties are given in the notes following the key.

For brevity we have used F for flagellomere (F-I, F-II, etc.) and T for tergum (T-I, T-II, etc.). Drawings were designed to supplement the key and were made by the junior author.

KEY TO *Ectemnius* OF AMERICA NORTH OF MEXICO

- 1. Pygidial plate absent (males) 2
- Pygidial plate present and nearly flat (Fig. 54) or incurved and troughlike (Fig. 55) (females) 28
- 2. Forefemur basoventrally with a sharp ridge, which may be U-shaped (Fig. 48-a) or linear (Fig. 34), or a carinate tooth (Figs. 47-a, 49-a, 50-a); F-III and/or IV somewhat concave and prolonged beneath (Fig. 18) 3
- Forefemur without a sharp ridge or tooth basoventrally, carinae (if any) extending ventrad from dorsal surface; F-III and/or IV modified or not 11
- 3. Terga II–IV without complete pale bands or median transverse spots, hindbasitarsus often dark, F-I depressed basoventrally (Fig. 18), pronotum with 1 or 2 transverse carinae 4
- Terga II–IV (or at least one of them) with a complete pale band or median transverse spot, hindbasitarsus and F-I various, pronotum with 1 strong transverse carina ending laterally in humeral angle ... 7
- 4. Pronotum with a posterior cariniform ridge and an anterior carina which ends laterally in humeral angle (as in Fig. 4); spots on T-V widely separated or absent 5
- Pronotum with 1 transverse carina which extends across middle of dorsal surface and ends laterally back of humeral angle (as in Fig. 1); spots on T-V often close together or coalesced 6
- 5. Occipital carina strong, a pitted groove along it in front; mandible with subbasal tooth of cutting edge smaller than either apical tooth (Fig. 16) *borealis* (Zetterstedt)
- Occipital carina moderate, a smooth groove (or nearly so) along it in front; mandible with subbasal tooth of cutting edge larger than either apical tooth (Fig. 17) *nigellus* Bohart
- 6. Pronotum projecting strongly laterally and dorsally, corner of transverse carina in posterior view nearly forming a right angle (Fig. 2), forebasitarsus broadened, flattened and bearing 3 or 4 dentiform setae ventrally (Fig. 43) *dives* (Lepeletier and Brullé)
- Pronotum moderately prominent, corner of transverse carina in posterior view broadly rounded (Fig. 5); forebasitarsus slender and without ventral, dentiform setae (Fig. 44) *atriceps* (Cresson)
- 7. Forebasitarsus about 3 times as long as broad (Fig. 40) 8
- Forebasitarsus 4 or more times as long as broad (Fig. 39) 9
- 8. Midbasitarsus hardly twice as long as broad (Fig. 45), mid- and hindfemora essentially black and yellowish *dilectus* (Cresson)
- Midbasitarsus at least twice as long as broad (Fig. 46), mid- and hindfemora usually mostly red and yellowish *rufifemur* (Packard)

9. F-I depressed basoventrally (Fig. 15), carinate angle of forefemur at about basal $\frac{1}{10}$ (Fig. 49-a) *arcuatus* (Say)
 - F-I not depressed basoventrally (Fig. 12), angle of forefemur at about basal $\frac{1}{4}$ (Figs. 47, 50) 10
10. Foretrochanter globular (Fig. 50); usually with terga II-VII and several terminal sterna extensively yellow; legs dark red, black, and yellow; hindbasitarsus dark *centralis* (Cameron)
 - Foretrochanter lengthened, not globular (Fig. 47) markings various *rufipes* (Lepeletier and Brullé)
11. F-III-IV simple (Fig. 7) 12
 - F-IV (or apparent III) somewhat misshapen and prolonged beneath (Figs. 9, 13, 14) 15
12. Scutum with distinct longitudinal microridging in posterior $\frac{1}{2}$, inner orbital silvery pubescent marks narrow 13
 - Scutum not microridged in posterior $\frac{1}{2}$, inner orbital silvery pubescent marks almost meeting medially 14
13. Forefemur with a sharp, retrorse, ventral spine near middle (Fig. 36); head dorsally with longitudinal ridging in front of ocelli, transverse ridging behind compound eyes; F-II depressed basoventrally (Fig. 7) *maculosus* (Gmelin)
 - Forefemur unspined; head dorsally without ridging; F-II not depressed ventrally *cephalotes* (Olivier)
14. Foretrochanter with an angle bearing a pointed brush of hairs (Fig. 35), S-II mostly or all dark *decemmaculatus* (Say)
 - Foretrochanter without an angle or pencil of hairs, S-II yellow with a sublateral dark spot *alpheus* Pate
15. F-I (actually I-II fused) with 2 strong ventral projections (Figs. 13, 14), F-I depressed basoventrally 16
 - F-I-II without ventral projections, F-I not depressed basoventrally 18
16. Flagellum with 2 strong ventral projections (Fig. 13)
 - *lapidarius* (Panzer)
 - Flagellum with 4 strong ventral projections (Fig. 14) 17
17. Most basal flagellar projection with an apical hair tuft
 - *sexcinctus* (Fabricius)
 - Most basal flagellar projection without unusual hair
 - *ruficornis* (Zetterstedt)
18. Humeral angle absent, or present and part of transverse carina (Fig. 6), or essentially so (Fig. 3) 19
 - Humeral angle present but well in front of transverse carina (as in Fig. 1) 23
19. Humeral angle absent or blunt 20
 - Humeral angle present and sharp, sometimes small 22

20.	T-V yellow banded, T-I coarsely punctate	<i>excavatus</i> (W. Fox)	
–	T-V with well separated yellow spots or all dark, T-I rather finely punctate		21
21.	T-V with lateral yellow spots, apical margin of median clypeal lobe more narrowly rounded (view from beneath, Fig. 22)	<i>stirpicola</i> (Packard)	
–	T-V dark, apical margin of median clypeal lobe more nearly truncate (view from beneath, Fig. 20)	<i>paucimaculatus</i> (Packard)	
22.	Pronotum with transverse carina ending laterally in a strongly projecting humeral angle (Fig. 6), ocellar triangle narrower than ocellocular distance	<i>sonorensis</i> (Cameron)	
–	Pronotum with transverse carina practically joining humeral angle which forms part of a short, inwardly directed carina (Fig. 3); ocellar triangle with breadth about equal to ocellocular distance	<i>satan</i> Pate	
23.	T-I mostly with coarse, separated punctures, T-V banded		24
–	T-I mostly with fine and well spaced punctures, T-V banded or not		25
24.	Clypeus with median lobe not protruding much, if any, in front of a line drawn along free edge of clypeus laterally (Fig. 33)	<i>scaber</i> (Lepeletier and Brullé)	
–	Clypeus with median lobe protruding well in front of a line drawn along free edge of clypeus laterally (Fig. 30)	<i>odyneroïdes</i> (Cresson)	
25.	Clypeal median lobe protruding about ½ of clypeal length in front of a line drawn across at mandible base (Fig. 31), a complete or medially interrupted yellow band usually present on at least one of T-II–IV		26
–	Clypeal median lobe protruding only slightly in front of a line drawn across at mandible base (Fig. 32); T-II–IV nearly always with lateral yellow or ivory spots, no bands		27
26.	Midtarsomere II in lateral view with a thornlike distal projection which is stronger than on III–IV (Fig. 38)	<i>continuuus</i> (Fabricius)	
–	Midtarsomere II in lateral view with a weak projection which is not noticeably stronger than on III–IV (Fig. 37)	<i>trifasciatus</i> (Say)	
27.	Pronotum strongly raised, unusually broad, humeral angle strongly projecting; markings usually yellow	<i>spinifer</i> (W. Fox)	
–	Pronotum moderately raised, humeral angle small; markings ivory	<i>besseyae</i> (Rohwer)	
28.	Clypeus apicomediaally produced into a strong truncate or somewhat excised snout (view from in front and below), flanked by a secondary tooth or angle (Figs. 19, 29)		29
–	Clypeus beveled, abbreviated, or rounded apicomediaally (Figs. 24, 25, 27, 28)		34

29. F-I about twice as long as II or longer (Fig. 10), humeri rounded off 30
 - F-I distinctly less than twice as long as II, humeri sharply pointed 32
30. Clypeus distinctly incised at apex, pygidial plate yellow except distally, sterna with considerable yellow *sexcinctus* (Fabricius)
 - Clypeus at most with a slight angled incision, pygidial plate black, sterna black or nearly so 31
31. Posterior face of propodeum more satiny and less reflective, fine transverse microridging close and nearly complete
 - *ruficornis* (Zetterstedt)
 - Posterior face of propodeum more polished and reflective, microridging more coarse, irregular and incomplete *lapidarius* (Panzer)
32. Pronotum with 2 transverse carinae, more anterior one ending laterally in humeral angle (about as in Fig. 4) *borealis* (Zetterstedt)
 - Pronotum with 1 transverse carina which ends laterally a little in back of humeral angle (Fig. 1) 33
33. Scape usually all pale in front, mandible usually maculate
 - *dives* (Lepeletier and Brullé)
 - Scape partly or all dark in front, mandible usually all dark
 - *atriceps* (Cresson)
34. Scutum with transverse microridging in front (at least anterolaterally), longitudinal microridging posteriorly 35
 - Scutum without complete microridges 36
35. F-I more than twice as long as broad (Fig. 11), clypeus with a large polished bevel (Fig. 27), spots of T-V widely separated
 - *maculosus* (Gmelin)
 - F-I less than twice as long as broad (Fig. 8), clypeus without a significant bevel, T-V with a broad pale band ... *cephalotes* (Olivier)
36. Clypeal apex distinctly beveled (bearing a smooth area on a deflected plane) (Figs. 25, 26, 28) 37
 - Clypeal apex rather thin, not or only minutely beveled 43
37. Pygidial plate triangular, nearly flat (Fig. 54) 38
 - Pygidial plate narrowed well before apex, somewhat depressed and channeled (Fig. 55) 39
38. Scutum closely but moderately and rather evenly punctate, femora mostly black and whitish, other markings usually whitish
 - *dilectus* (Cresson)
 - Scutum coarsely and rather unevenly punctate, femora often extensively reddish *rufifemur* (Packard)
39. Clypeal bevel transverse, midlength about $\frac{1}{4}$ that of clypeus (Fig. 26) 40

– Clypeal bevel roughly triangular, midlength about $\frac{1}{3}$ that of clypeus (Figs. 25, 28)	41
40. F-I more than twice as long as broad, T-I finely and closely punctate, legs mostly black and yellow	<i>arcuatus</i> (Say)
– F-I slightly less than twice as long as broad, T-I moderately and closely punctate, legs mostly red and yellow ..	<i>sonorensis</i> (Cameron)
41. Area of frons in back of scapes polished and occupying about $\frac{1}{2}$ of lower frons, small species with all dark mandible and basitarsi; terga with widely separated whitish spots	<i>nigellus</i> Bohart
– Area of frons in back of scapes almost completely covered with pubescence; large species with maculate mandible and basitarsi; terga banded or with yellowish spots	42
42. Sterna dark, terga black with yellow spots or T-I–II extensively red	<i>decemmaculatus</i> (Say)
– Sterna yellow with a round, black, sublateral spot on S-II; terga yellow banded	<i>alpheus</i> Pate
43. Humeral angle absent or blunt	44
– Humeral angle present and sharp, sometimes small	46
44. Terga rather unevenly and coarsely punctate, coarsest on I; T-V usually banded, or if not, T-I–II reddish	<i>excavatus</i> (W. Fox)
– Terga rather evenly and finely punctate, T-V all dark or laterally spotted	45
45. Clypeus with anterior edge of median lobe with a produced and rounded central lobe (Fig. 23), hindbasitarsus yellow, T-V usually with large yellow spots or a band	<i>stirpicola</i> (Packard)
– Clypeus with anterior edge of median lobe slightly undulate (Fig. 21), hindbasitarsus usually dark, T-V usually dark or with a tiny lateral spot	<i>paucimaculatus</i> (Packard)
46. T-I coarsely punctate (Fig. 53)	47
– T-I with medium fine to fine punctation	49
47. Humeral angle in front of transverse pronotal carina (about as in Fig. 2)	<i>scaber</i> (Lepeletier and Brullé)
– Humeral angle part of transverse pronotal carina (about as in Fig. 6)	48
48. Last few sterna black, metanotum closely punctate, hindbasitarsus yellow, femora mostly red or red and yellow	<i>rufipes</i> (Lepeletier and Brullé)
– Last few sterna yellow, metanotum mostly polished toward middle, hindbasitarsus dark, femora mostly dark	<i>centralis</i> (Cameron)
49. Clypeal apex obtusely rooflike in edge-on view (Fig. 24), punctures of T-I extremely fine and well separated, pronotal lobe distinctly punctate	50

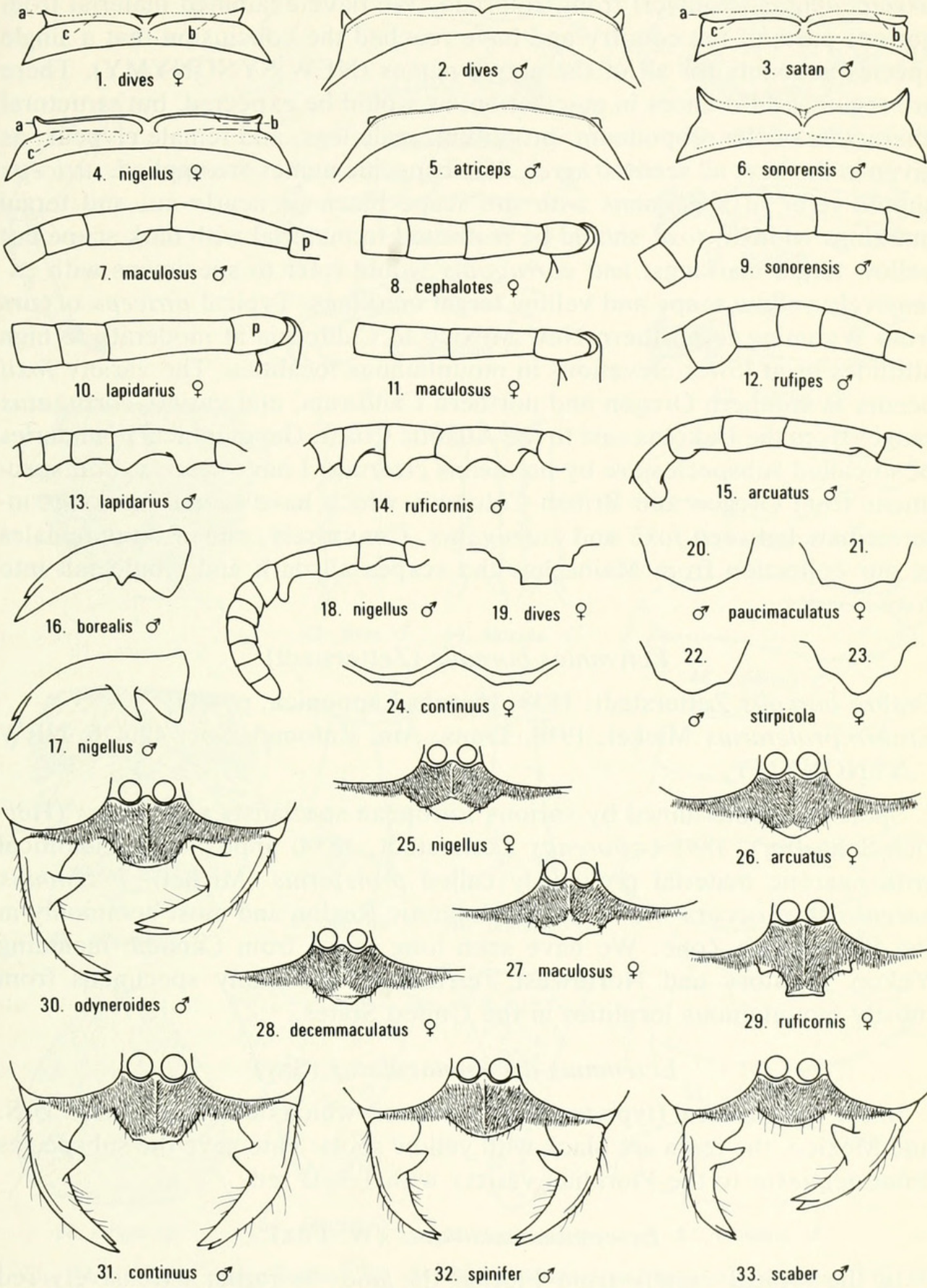
- Clypeal apex straight or curved in edge-on view, punctures of T-I and pronotal lobe various 51
- 50. Posterior face of propodeum more smooth, with close and transverse microridges, many of which extend between scattered punctures to midline (use magnification of 25-50 times), imparting an overall smooth and somewhat silky appearance (Fig. 41) *continuus* (Fabricius)
- Posterior face of propodeum more rough, partly shiny, with some well separated oblique ridges among punctures and reticulation, not at all silky (Fig. 42) *trifasciatus* (Say)
- 51. Pronotal transverse carina practically touching humeral angle laterally, latter a part of a short inwardly directed carina; pale spots of T-III as close together or closer than those on T-II; bands usually present on T-I-IV-V, narrowly separated spots on T-II-III *satan* Pate
- Pronotal transverse carina plainly behind humeral angle laterally; pale spots of T-III, when present, farther apart than those on T-II 52
- 52. T-I with medium-sized punctures, pronotal lobe appearing closely punctate at 27x magnification; T-III all dark or with a small lateral spot, T-II-IV-V usually banded *odyneroides* (Cresson)
- T-I with fine to very fine punctures, pronotal lobe appearing smooth at 27x magnification; T-II-V with lateral spots 53
- 53. Pronotum with a sharp humeral angle which projects forward and somewhat outward, markings usually yellowish ... *spinifer* (W. Fox)
- Pronotum with a small humeral angle, markings whitish or rarely pale yellow *besseyae* (Rohwer)

Ectemnius atriceps (Cresson)

The rather "difficult" *Ectemnius* s.s. group contains *dives*, *atriceps*, *bo-realis*, and *nigellus*. In Bohard (1976:424) *atriceps* from Colorado was considered a senior synonym of *brunneipes* (Packard) from Pennsylvania, and *foxii* Kincaid from Washington state. On the other hand, *corrugatus* (Packard) from western Virginia was considered a senior synonym of *pauper* (Packard) from West Virginia, *operus* (Rohwer) from New Mexico, and

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Figs. 1-2, 5-6. Pronotum, dorsal; (a) humeral angle, (b) anterior carina (solid line) or rounded margin (dotted line), (c) transverse carina (solid line) or cariniform ridge (broken line). Figs. 3-4. Pronotum, oblique posterior view. Figs. 7-15. Pedicel of antenna (p) and basal flagellomeres, lateral. Figs. 16-17. Mandible, inner lateral view. Fig. 18. Pedicel and flagellum of antenna. Figs. 19-23. Clypeal margin, ventral. Fig. 24. Clypeal apex, edge-on view. Figs. 25-29. Clypeus to show pubescence and apical bevel, front view. Figs. 30-33. Clypeus and mandibles, front view.



drymocallidus (Rohwer) from Colorado. We have examined material from various parts of the country and have reached the conclusion that a single species accounts for all of the above names (NEW SYNONYMY). There are regional differences in maculation, as would be expected, but structural characters of the propodeum, pronotum, male legs, and female clypeus, as given in the key, all seem to agree. If subspecific names are applied, *atriceps* should refer to specimens with the scape black or nearly so, and tergal markings whitish; *foxii* should be restricted to material with dark scape but yellow tergal markings; and *corrugatus* would refer to specimens with extensively yellow scape and yellow tergal markings. Typical *atriceps* occurs from Wyoming to northern New Mexico to California at moderate to high altitudes or at lower elevations in mountainous localities. The variety *foxii* occurs in southern Oregon and northern California, and variety *corrugatus* ranges from the Dakotas east to the Atlantic Coast. Geographical boundaries of so-called subspecies are by no means clearcut. I have seen several specimens from Oregon and British Columbia which have scapal markings intermediate between *foxii* and *corrugatus*. Conversely, one of three females in our collection from Maine has the scapes all dark and would fall into *foxii*.

Ectemnius borealis (Zetterstedt)

Crabro borealis Zetterstedt, 1838. Insecta Lapponica, p. 443.

Crabro proletarius Mickel, 1916. Trans. Am. Entomol. Soc. 42:426. NEW SYNONYMY.

Specimens determined by various European specialists as *nigrinus* (Herich-Schaeffer), 1841 (= *borealis* Zetterstedt, 1838) appear to be identical with nearctic material previously called *proletarius* (Mickel). *Ectemnius borealis* thus occurs widely in the Holarctic Region and most commonly in the Boreal Life Zone. We have seen long series from Canada, including Yukon Territory and Northwest Territories, and many specimens from mostly mountainous localities in the United States.

Ectemnius decemmaculatus (Say)

In the typical form (type-locality: Missouri) which occurs in eastern U.S. and Mexico, the terga are black with yellow spots. Pate gave the subspecies name *tequesta* to the Floridian variety with T-I-II red.

Ectemnius excavatus (W. Fox)

In the typical variety from Florida the body is rather extensively red marked and T-III-V of the female may be all black. In most other localities east of the 100th meridian T-I and/or II-IV have yellow spots and V is banded. For those who wish to recognize this form as a subspecies, the

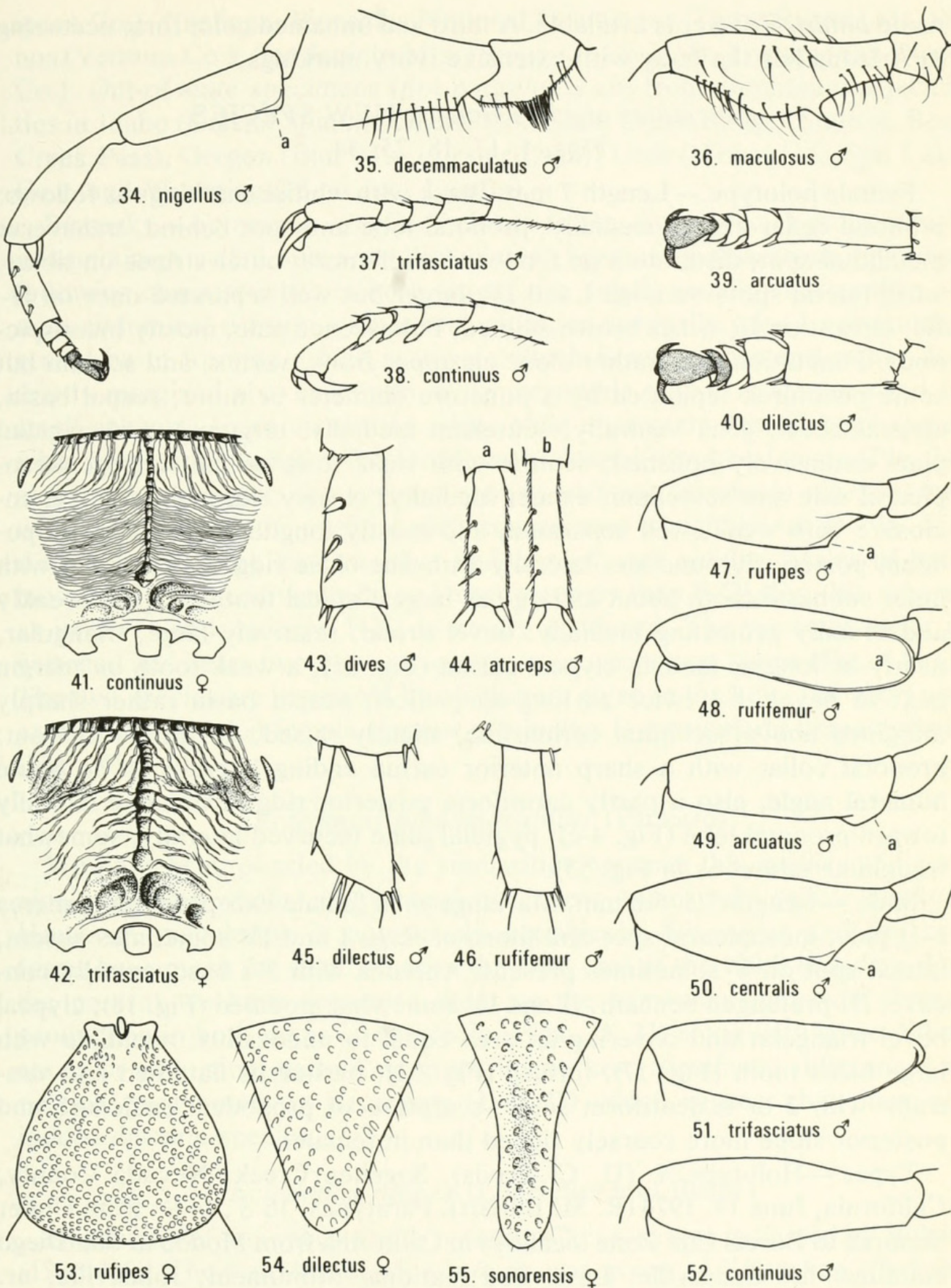


Fig. 34. Foreleg, inner profile. Fig. 35. Foretrochanter and base of forefemur. Fig. 36. Foretrochanter and forefemur. Figs. 37–38. Midtarsus. Figs. 39–40. Foretarsus. Figs. 41–42. Propodeum, posterior. Figs. 43–44. Forebasitarsus, ventral; from (a) Utah, and (b) Virginia. Figs. 45–46. Midbasitarsus, profile. Figs. 47–50. Forefemur, inner profile, (a) basoventral tooth. Figs. 50–52. Forefemur, outer view. Fig. 53. Punctuation of tergum I, dorsal. Figs. 54–55. Pygidial plate.

name *banksi* Rohwer is available. A third and unnamed color form occurring in Arizona has the body with extensive ivory markings.

Ectemnius nigellus Bohart, NEW SPECIES

Figs. 4, 17, 18, 25, 34

Female holotype.—Length 7 mm. Black with whitish markings as follows: pronotal collar except medially, pronotal lobe and spot behind, transverse metanotal spot, distal dots on fore- and midfemora, outer stripes on tibiae, small lateral spots on terga I and IV, larger but well separated ones on II–III, closest on II; wings brown stained. Pubescence pale, mostly inconspicuous. Punctuation fine, rather close on upper frons, vertex, and scutum but some punctures separated by a puncture diameter or more; scapal basin, clypeal bevel, gena ventrally, scutellum medially, tergum I, and pygidial plate extensively polished; scutum with weak longitudinal ridging; mesopleural side and scutellum, except medially, closely ridged; propodeal enclosure with weak, well separated, and mostly longitudinal ridges; propodeum posteriorly punctate, laterally with fine close ridging. Mandible with inner subbasal tooth about as large as largest apical tooth; clypeus weakly and broadly projecting medially; bevel broad, relatively large, triangular, nearly as long as median clypeal carina (Fig. 25), a weak tooth on margin next to bevel; F-I twice as long as pedicel; scapal basin rather sharply margined above; occipital carina fine, slightly raised, not pitted in front; pronotal collar with a sharp anterior carina ending laterally in an acute humeral angle, also a partly cariniform posterior ridge extending laterally toward pronotal lobe (Fig. 4-c); pygidial plate incurved laterally, somewhat troughlike (about as in Fig. 55).

Male.—Length 5.5–6.0 mm. Markings as in female except foretarsomeres I–II pale, mesopleural spot and those of terga I and IV sometimes absent, lateral spot on V sometimes present. Antenna with F-I basoventrally concave, III prolonged beneath, II and IV somewhat modified (Fig. 18); clypeal bevel triangular and covering an area equal to midocellus; mandible with large basal tooth (Fig. 17), foreleg (Fig. 34), basitarsus flattened and ventrally with 2 or 3 dentiform setae; sculpture of propodeal enclosure and posterior slope more coarsely ridged than in female.

Types.—Holotype ♀ (U. C. Davis), Sagehen Creek, Nevada County, California, June 14, 1974 (R. M. Bohart). Paratypes, 16 ♂, 44 ♀, from Upper Sonoran to Boreal Life Zone localities in California from Modoc to San Diego counties: nr. Cedarville, Lava Bed National Monument, Johnsville, nr. Sierraville, Independence Lake (Sierra Co.), Sagehen Creek (Nevada Co.). Tioga Pass and Sonora Pass (Mono Co.), Columbia, Chinese Camp, Angels Camp, China Flat, Yosemite, Icehouse Road, and Echo Lake (El Dorado Co.), Luther Pass and Winnemucca Lake (Alpine Co.), San Francisco, Samuel Springs (Napa Co.), Mt. Diablo (Contra Costa Co.), Mt. Bullion (Mar-

iposa Co.), Coalinga, Pinnacles National Monument, Three Rivers, Mt. Pinos (Ventura Co.), San Jacinto Mts. (Riverside Co.), Mt. Laguna (San Diego Co.). Out-of-state specimens (not paratypes) are from mountainous localities in Idaho (Galena Summit, Blaine Co.; Slate Creek Ranger Station, Bear Creek Pass), Oregon (Blue Mts., Crater Lake), Utah (Weber Co., Salt Lake Co.), and Wyoming (28 mi. sw. Lander).

Remarks.—*Ectemnius nigellus* belongs to the *dives* species group which is sometimes called subgenus *Ectemnius*. Species of this group have the following characteristics in both sexes: size small, usually shorter than 10 mm; abdominal dorsum with lateral spots, occasionally joined posteriorly; scapal basin forming a high rectangle which is non-setose and rather distinctly margined above; humeri sharp; mandible with a moderate sized to small subbasal tooth on cutting edge. Male characters are: clypeus somewhat projecting medially, forefemur with a cariniform basal angle (Fig. 34-a). Female characters are: clypeus sharply truncate (except in *nigellus*) and with a flanking tooth; pygidial plate narrow and troughlike (as in Fig. 55). As indicated in the key, *nigellus* and *borealis* are similar. Males of both have F-III produced ventrally and more strongly than F-IV (Fig. 18), whereas in *dives* and *atriceps* F-III is hardly produced. The pronotal collar is flattened and bears two transverse carinae or cariniform ridges (Fig. 4-b, c). The two species are separated by characters given in the key. The short and extensively beveled female clypeus of *nigellus* is particularly characteristic (Fig. 25).

Ectemnius paucimaculatus (Packard)

We have been puzzled by the similarities between this species and *stirpicola*. On the whole, *paucimaculatus* is less extensively yellow marked. However, maculation is notoriously variable in *Ectemnius* and the two forms have much the same range in the U.S. east of the 100th meridian. For the present we have separated them on the somewhat narrower clypeal production in both sexes of *stirpicola* (Figs. 22, 23) along with some differences in abdominal pattern as given in the key. Significant differences in nesting were noted by Krombein (1964:75) which suggest that these are indeed discrete species.

Ectemnius rufipes (Lepeletier and Brullé)

Synonymy of this species with *texanus* (Cresson) was indicated by Bohart (1976:427). The type-locality for *rufipes* was given as "Caroline" but the type has been lost. A neotype female was established by Bohart (1976:627) from Decatur, Alabama. In the typical form from Texas, Oklahoma, Alabama, northern Florida to the Carolinas T-II, IV-VI are yellow marked. In the more southern Floridian form, which Pate called *ais*, T-II (rarely also I), and IV-VI are reddish.

Ectemnius satan Pate

Typical *satan* from Arizona and New Mexico (type-locality: McKinley Co., New Mexico) has ivory markings. A widespread variety from California has the maculation deep yellow.

Ectemnius sexcinctus (Fabricius)

In Bohart (1976:428) *yosemite* Pate was listed as a distinct species. It now appears that it simply represents the first record of New World material of *sexcinctus* (Fabricius), and *yosemite* should be added to the long list of synonyms under the widespread palearctic species (NEW SYNONYMY). Most characteristic is the hair tuft under the basal flagellar projection in the male. Females have the clypeal apex incised. Our material is from Lake Tahoe and Sonora Pass, California, and Logan, Utah, all collected in August to October.

Ectemnius trifasciatus (Say)

This species was originally based on a male from Northwest Territories, Canada. Since its identity has sometimes been questioned and the type is non-existent, we are designating a NEOTYPE male in the Canadian National Collection, Ottawa. It bears the following data: Norman Wells, Northwest Territories, July 13, 1949 (W. R. M. Mason). *E. trifasciatus* is fairly common and widespread in Canada and its range there includes Newfoundland (Codroy) and Labrador (Goose Bay). In United States its distribution is essentially northern and boreal. Throughout its range it occurs with *continuus*, a closely related and more abundant species with holarctic distribution. Characters of the male midtarsi (Figs. 37, 38) as given in the key afford easy separation. Females are much closer, but the more coarsely sculptured posterior propodeal area (Fig. 42) and the usually whiter markings of *trifasciatus* will help distinguish them. It should be noted that some California females have bright yellow tergal markings.

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