Native Bees

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(Continued from Page 80, Vol. XIII, No. 2)

Wasp Bees

As we have mentioned before, there are many bees which do not make nests, but deposit eggs in nests of other bees. The genera, *Psithyrus, Coelioxys,* and *Stelis* were discussed in previous articles. In general, these insects have smooth bodies and do not collect pollen. The others will be treated in the present article.

Nomada

These are the ones to which the term wasp bee best applies. They are smooth bodied, usually red with yellow markings, sometimes black. The wings have three submarginal cells, the discoidal cell is long, the marginal pointed (fig. 2E). They are not active in their movements. For the most part they parasitize nests of *Andrena.* In Europe (4) the association of host and parasite seems well determined but little has been done in this country. Species of *Andrena* fly mostly in April, May and June, but I have taken few specimens of *Nomada* in April or May. Several species are found in June but the largest number were taken in August. This may merely indicate how incomplete the spring records are. The specimens reported here were identified to 1914 by Prof. Myron H. Swenk (10, 11) and later collections are not yet all determined. The species are numerous. About 250 were listed for North America (1) by Cockerell in 1911. Friese (4) listed 24 from Germany and Cockerell (2) 76 from Colorado in 1928. Swenk (10, 11) recorded 51 for Nebraska in 1915, of which 19 were described for the first time.

The large number of species with slight differences between them suggests that some of these variations may be due to the fact that one species of *Nomada* is associated with different host species of *Andrena.* Mickel (6) demonstrated that a certain parasitic wasp (*Dasymutilla bioculata*) showed two distinct size ranges according to size of its host. However, the number of species of *Andrena* is large and much study will be needed to clear up the relationships of these insects. Friese's records show about the same number of species flying all through the season. For several species he reports that each parasitizes several different species of *Andrena,* in some cases appearing in spring and again in late summer. One species of *Nomada* he records as parasitic on *Eucera,* an entirely different group of bees, a few on *Halictus* and two on *Panurgus.*

1. *Nomada vincta* Say. Length 10 mm.; thorax largely black with some reddish edging, yellow spots front, sides and rear; abdominal segments yellow on basal half, reddish brown apically. This was one of the first American species to be described from Indiana in 1837. It is common and widely distributed, probably a parasite of *Andrena helianthi* since it is found at the same time and places. It was taken Aug. 4—Sept. 8 on sunflowers, gumweed (*Grindelia squarrosa*), aster (*A. sagittifolius*), tall coneflower (*Rudbeckia laciniata*) and goldenrod (*Solidago ridiga* and *serotina*).

   This species probably represents the group as well as any. In general color it suggests the paper wasp (*Polistes fuscatus*) and its lazy flight also suggests a wasp rather than a bee. No hairs are noticed on the body unless certain areas are examined carefully with a magnifier.

2. *Nomada modesta* Cress. Similar to *vincta* in general appearance, a little smaller. It belongs to a different group of species which have a spine on the front coxa. This is another late summer species, taken June 29—Aug 13 on golden aster (*Chrysopsis villosa*), gaillardia (*G. aristata*) wild flax (*Linum rigidum*) and prairie-clover (*Petalostemon oligophyllum*). Both the typical form and var. *vegana* Ckll. were taken. Some specimens have been found at Fargo but it seems more common west of the Red River Valley.

3. *Nomada melanoptera* Ckll. Length 13 mm.; black with wide yellow bands on abdomen, yellow collar, 2 spots on rear of thorax; legs and sides of face pale red; head and thorax very coarsely punctured, abdomen finely and closely. Five females and one male at sunflower (*H. petiolaris*), Sheldon, Aug. 20, 1949. This somewhat resembles *N. vincta* but is stouter, coarsely punctured and entirely black underneath. One specimen (15351) has more extensive yellow markings—tubercles, spots on mesopleurae, sides of propodeum, two abdominal segments below and lateral face marks reaching the vertex. Determined by H. G. Rodeck.

Figure 1. Wasp bees, twice natural size. Left to right: Sphecodes, Nomada vincta, Triepeolus, Neopasites heliopsis. Photo by Don Nelson.

4. *Nomada vierecki* Ckll. Length 7 mm.; body dark red, nearly black with cream colored markings; female with sides of face, collar, 6 spots around thorax and bands on abdomen; thorax shining, strongly but not closely punctured; abdomen red, finely punctured; legs pale red; male with face yellow to antennae and all along eyes. One female, 2 males, Marmarth, July 4, 1949 on sunflower (*H. petiolaris*), determined by Rodeck.

5. *Nomada articulata* Sm. Length 8—10 mm.; female mostly red; abdomen of male slender, yellow banded; antennae of male yellowish below, blackish above. Most of the specimens were ssp *dacotana* Ckll., which has the thorax mostly red but with a black streak (all black in typical *articulata*). This bee also has spines on the coxae but differs from *Modesta* in the antennae. It is a common, mid-summer species, June 2—Aug. 13, visiting flowers of lead-plant (*Amorpha canescens*), mustard (*Brassica campestris* and *nigra*), dogbane (*Apocynum androsaemifolium*) fleabane (*Erigeron philadelphicus*), blue lettuce (*Lactuca pulchella*), sweet clover (*Melilotus officinalis*), evening primrose (*Oenothera serrulata*), buttercup (*Ranunculus macounii*), ragwort (*Senecio canus*) dandelion (*Taraxacum officinale*) and meadow parsnip (*Zizia aurea*).

6. *Nomada scita* Cress. Similar to *articulata* but appearing earlier. One male taken at Dickinson, May 25, on *Agoseris cuspidata* by C. H. Waldron, was identified by Swenk and one female at Garrison, July 1, 1949 on blue lettuce was determined by Rodeck.

7. *Nomada vicinia stevensi* Swenk. Length 7—9 mm.; red with much black on thorax; cream colored band on second abdominal segment narrow or broken in middle, wide at sides; narrower spots on first segment, usually bands on others. Described by Swenk (10) from several specimens taken at Fargo, Aug. 7-25, on gumweed, sweet clover (*M. alba*) and goldenrod (*Solidago canadensis*).

8. *Nomada erigeronis* Rob. Length 11 mm.; red with a black line on middle of thorax; 2 small yellow spots on first segment of abdomen, 2 large ones almost meeting on second and bands on other segments. This large species belongs to the subgenus *Centrias* and has spines on front coxae. One female from Marmarth, July 4, on purple coneflower (*Brauneria angustifolia*) I identified as this species. I had also a number of specimens from Blue Rapids, Kansas, taken on the same flower along with *Andrena helianthiformis*, which is probably its host.

9. *Nomada beulahensis* Ckll. Similar to *vicina*. Described in 1903 from New Mexico. Swenk referred to it one specimen taken at Fargo, Aug. 17 on gumweed.

10. *Nomada snowii* Cress. Described in 1878 from Colorado. Swenk placed here a specimen from the Black Hills of South Dakota and one from Valley City, Aug. 13, on gumweed.

11. *Nomada aquilarum* Ckll. Length 6 mm.; mostly black with lateral spots on segments 2—4 of the abdomen, a narrow band on fifth segment. Described in 1905 from one male collected in New Mexico. Swenk (10) described the female from one taken at Fargo, July 31, 1910, at blue ettuce. A male was caught Aug. 13, 1910, on goldenrod (*Solidago gigantea*).

    It seemed strange that this species found in New Mexico should next be found in North Dakota. Swenk described two females taken at Fargo on gumweed and sweet clover as a new species, *N. dacotensis*. Rodeck (7) considers these the same as *aquilarum*, and including also *N. cockerelli* Graen., the species *aquilarum* is now known to occur from Montana to Wisconsin with the New Mexico record still isolated.

12. *Nomada zebrata* Cress. Length 11 mm.; pale, brownish red with wide yellow bands on abdomen both above and below; yellow on lower face, sides of thorax, 2 spots on rear angle and large ones on rear face of thorax; head and thorax coarsely punctured, abdomen not punctured, legs red. Two females at *Tamarix*, Fargo, June 2, 1924, Nos. 14766 and 14767, determined by Rodeck.

13. *Nomada citrina flavomarginata* Swenk. Length 12 mm.; much like *superba* but more extensively yellow; abdominal segments mostly yellow, red on both margins; legs yellow. One female at blue lettuce, Marmarth, July 4, 1949, No. 15222, determined by Rodeck.

14. *Nomada subpacata* Swenk. Length 7 mm. mostly red; abdomen black above with two triangular, white spots on segment 2, smaller ones on 3 and 4. Described by Swenk (5) from one female collected at Fargo, Sept. 16, on *Aster ericoides*.

15. *Nomada skinneri* Ckll. (?) Length 10 mm.; dark red with two rounded spots on second abdominal segment. One female, No. 15370, Fargo, June 22, 1949 on flowers of mustard (*Brassica arvensis*). This looks much like *rubi* but has slender mandibles. Determined by Rodeck.

16. *Nomada ziziae* Swenk. Length 6—7 mm.; red, abdomen with rounded, pale yellow spots on segments 2 and 3. Described by Swenk (11) from a number of specimens taken at Fargo, May 20—June 22, mostly on meadow parsnip, one on raspberry (*Rubus idaeus*). Swenk commented that this might be only a form of *N. sayi* Rob., which is one of the common species in Nebraska.

17. *Nomada obtusata* Swenk. Length 7 mm.; similar to *ziziae*. Described (11) from two females, Fargo, June 20, on wild turnip (*Brassica campestris*).

18. *Nomada propinqua* Swenk. Length 7—8 mm.; red with some black markings; second segment of abdomen with a pair of yellow spots and third with smaller ones. Closely related to *ziziae*. One female from Garrison, July 1, 1949, on blue lettuce, determined by Rodeck.

19. *Nomada cressonii* Rob. Similar to *ziziae* but larger; spots on segment 4 and a band on 5. Swenk identified one male, taken at Fargo, May 6 on willow.

20. *Nomada maculiventer* Swenk. Length 8 mm.; red with prominent yellow bands on abdomen. Described by Swenk (11) from several specimens from Medora, Aug. 30, on goldenrod (*S. canadensis* and *rigida*).

21. *Nomada tricurta* Swenk. Length 8—10 mm.; red with yellow bands on abdomen. Described by Swenk (11) from a number of specimens taken at Fargo, June 14-22, on fleabane and meadow parsnip.

22. *Nomada civilis* Cress. Length 8 mm.; mostly black with a narrow, yellow band on first segment of abdomen interrupted in the middle. One female from Cannon Ball, Apr. 15, on willow.

23. *Nomada rubi* Swenk. Length 8—9 mm.; dark red with rounded yellow spots on abdominal segments 2 and 3. Many specimens at Fargo, June 15-22, at fleabane, raspberry, Frenchweed (*Thlaspi arvense*) and meadow parsnip. This and the next three species described by Swenk (11) belong to the subgenus (*Gnathias*) which has mandibles notched at the tip.

24. *Nomada subrubi* Swenk. Length 5—8 mm.; usually no spots on segment 3 but often on 6. Many specimens at Fargo, June 7-22, same plants as *rubi*.

25. *Nomada lepida* Cress. Length 8 mm.; thorax mostly black; abdomen mostly red with two yellow spots on segments 2 and 3. Several from Fargo, May 7, on willow and plum.

26. *Nomada carolinae* Ckll. Similar to *lepida*. One specimen from Dickinson, May 8, on willow by C. H. Waldron.

27. *Nomada fuscicincta* Swenk. Length 5 mm.; dark red with much black, including bands across abdomen. Several specimens at Fargo, May 30—June 22, at meadow parsnip.

28. *Nomada hydrophilli* Swenk. Length 5—6.5 mm.; black with yellow spots on thorax and segments 2 and 3 of abdomen; scape of antennae much thickened and third joint very short. Lisbon and Fargo, May 30—June 14, on waterleaf (*Hydrophyllum virginicum*), yellow violet (*Viola eriocarpa*) and meadow parsnip.

29. *Epeoloides pilosula* (Cress.). Length 10 mm.; entirely black, no red or light markings. This is supposedly a parasite of *Macropis morsei*. Several specimens were taken along with *Macropis* at Fargo, July 20 and 27 at flowers of blue lettuce.

Epeolus and Triepeolus

Friese (4) called these "velvet bees", a name which is somewhat suggestive after sufficient interpretation. They are chiefly black with white markings which at first glance seem to be in the body material. On careful examination the white markings are found to consist of very short but branched hairs lying close against the body. The abdominal segments are tipped with white bands;

the first one often has a basal white patch leaving an enclosed black area. The thorax is often bordered with white and marked with two longitudinal white lines. The legs are often red and in some species the thorax has red markings.

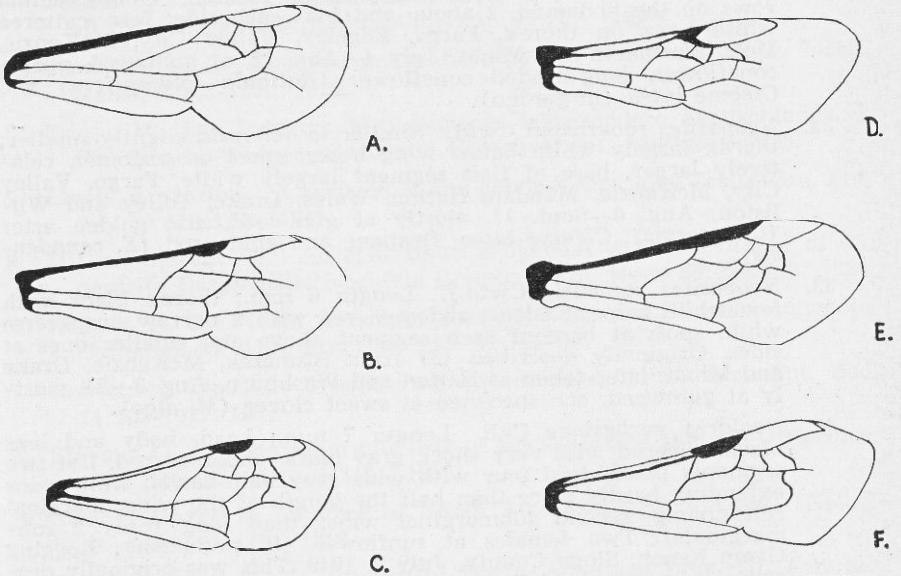

Figure 2. Forewings of various bees. A, Anthophora; B, Hylaeus; C, Certina; D, Melissodes; E, Nomada; F, Colletes. Drawn by Thomas Swinland.

The species of *Epeolus* are reported to be parasites of *Colletes*, while those of *Triepeolus* infest the nests of *Melissodes* and related genera. The relationship of parasites to hosts seems to have worked out quite well in the European species but little is known about the North American forms. Several species are represented in the North Dakota material but they have not been identified.

30. *Epeolus dacotensis* Stevens. This is our largest species, 12—14 mm. in length, black with wide white abdominal bands. It was described (9) from several specimens collected at Williston, Aug. 8 and 14, 1915, at the bank where *Anthophora* was nesting and on which it was presumed to be parasitic. Two more were taken at Marmarth, July 4, at flowers of blue lettuce and sunflower (*H. petiolaris*). The type specimen was sent to the U. S. National Museum and another specimen to Prof. Cockerell. At the time, Cockerell considered it an *Epeolus* but later (2) listed it as *Triepeolus* in a key to North American species.

Neopasites

These look about as little like bees as any of our species. They are small insects 5—8 mm. long, chiefly black or the abdomen red. The body surface is rough and has some markings of small white hairs. The species were reviewed by Crawford (3) and again by Linsley (5). C. N. Ainslie found one species living in the nests of

Calliopsis andreniformis in Iowa. In this genus and some related ones the antennae of both sexes are 12-jointed, whereas in most bees the antennae of the females have 11, the males 12 joints.

31. *Neopasites heliopsis* (Rob.). Length 5 mm.; brownish black, 4 white dots on each abdominal segment forming 4 longitudinal rows on the abdomen, 2 above and 1 at each side; few scattered white hairs on thorax. Fargo, Edgeley, Valley City, McKenzie, Mott, Marmarth and Minot, July 4—Aug. 12, at gumweed, purple coneflower, long-headed coneflower (*Ratibida columnifera*) and *Cleome lutea* (in garden).

32. *Neopasites robertsonii* Cwfd. Similar to *heliopsis*, slightly smaller; thorax largely white below wing bases; spots on abdomen relatively larger, base of first segment largely white. Fargo, Valley City, McKenzie, Mandan, Hatton, Wales, Drake, Tolley and Williston, Aug. 6—Sept. 11, mostly at gumweed, also golden aster (*Chrysopsis*), *Cleome lutea*, fleabane and goldenrod (*S. canadensis*).

33. *Neopasites stevensi* (Cwfd.). Length 6 mm.; thorax black with few white hairs at edges; abdomen red with 2 narrow, transverse white spots at base of each segment above and smaller ones at sides. Originally described (3) from Bismarck, McKenzie, Drake and Minot, later taken at Hatton and Washburn, Aug. 3—24, mostly at gumweed, one specimen at sweet clover (*M. alba*).

34. *Neolarra verbesinae* Ckll. Length 7 mm.; head, body and legs black, covered with very short, gray hairs; abdomen red, last two segments black, first four with wide gray hair bands; wing veins extending hardly more than half the length of the wing, marginal cell oblong, second submarginal wider than long (only 2 submarginals). Two females at sunflower (*H. petiolaris*), Logging Camp Ranch, Slope County, July 2, 1949. This was originally described as a wasp and I at first took it to be one. The identification has been verified by Timberlake. These bees are presumed to be parasites of *Perdita*. The body is rather smooth, not dull and rough as in *Neopasites*.

Sphecodes

These are small to medium sized bees (5—10 mm.), the thorax and head black, the abdomen usually red. Their bodies have very few hairs. The tip of the abdomen does not have a furrow as in Halictus. The wing venation is like that of *Halictus* (fig. 2) but the second submarginal cell is usually shorter than high. Friese (4) called them hump bees, diggerwasp bees or blood bees, the first referring to a somewhat unusually rounded form of the thorax, the last to the red abdomen and the second to the similarity in size and color to that of some of the diggerwasps of the family *Larridae*. These wasps catch live grasshoppers or other insects for their young but often visit flowers for nectar for their own food. They are quick in movement and are seen running over the ground hunting their insect prey.

The species of Sphecodes are numerous and widely distributed. They are difficult to identify and the North American forms have not been thoroughly studied. The present North Dakota collection contained some 300 specimens, probably representing at least 6 or 8 species. Robertson (8) described several species and listed 13 for his locality in southern Illinois. Cockerell (2) reported 13 from Colorado. For the most part they inhabit nests of Halictus, but according to observations in Europe, they also occur in nests of *Andrena*, *Colletes* and other genera. Friese felt that their parasitism was less highly developed than in other genera which are discussed in the present article. As in *Halictus*, mating occurs in the fall, the fertilized females over-winter and males usually develop in late summer. They visit many kinds of small flowers where nectar can be secured with their short tongues.

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OLDER, YOUNGER, SWEETER

What the U. S. population is doing would strain the credulity of a chameleon. The census bureau says it is growing older, younger, and more feminine with every breath.

Figures since 1940 are given to back up the statement. In these intervening years, the personnel of Uncle Sam's farms and towns has bulged at both ends, the number of very young and of aged persons reaching new peaks. Meanwhile, woman's matrimonial chances backslid.

There were 1,007 males for every 1,000 women in 1940 but by 1948 only 991 males were available per 1,000 females.

The nation's total population is up 11 per cent from 1940, the year of the last official census.

The increase is accounted for principally by higher birth rate and longer life spans than formerly. Immigration was a smaller factor.

The number of children under five years increased by 43 per cent or almost four times as fast as the total population. There were 22 per cent more persons over 65 living in 1948 than in 1940, an increase double that of the whole populace. By last year the nation had 15 million children under five and 11 million adults 65 or more.

The number of persons 10 to 19 declined by more than 9 per cent. As a result, school attendance declined by about 1½ million.

In the population 20 to 64 years old, there were increases ranging from about 4 per cent for the group 20 to 24, to 23 per cent for group 55 to 64. (Condensed from Healthways)