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## Three Palearctic species of *Rugilus* Leach in North America (Coleoptera: Staphylinidae, Paederinae): redescrptions, new synonymy, and new records

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**Abstract:** Redescrptions, new synonymy, new North American records (including maps), notes on habitat preferences, and remarks on the status of three Palearctic species of *Rugilus* in North America are provided. The widespread Palearctic *R. orbiculatus* (Paykull) is reported for the first time from North America from numerous eastern and western localities. *Rugilus latiusculus* (Casey, 1884) and *R. oregonus* (Casey, 1905) are shown to be conspecific with *R. orbiculatus* (Paykull, 1789) (NEW SYNONYMY); a lectotype for *R. latiusculus* is designated. *Rugilus rufipes* Germar, an immigrant species known previously from Washington and Ontario, is newly recorded from Quebec. *Rugilus fragilis* (Gravenhorst), recorded previously from eastern Canada, is listed for the first time from the United States (Maine and New York).

### Introduction

Members of the paederine genus *Rugilus* Leach are remarkably characteristic rove beetles because of their large heads that are often broader than the elytra, their exceedingly narrow necks, their strongly narrowed pronota, their coarsely punctate heads and pronota, and their broadly expanded prosterna. These staphylinids, which resemble large ants (Fowler, 1888), generally inhabit woodlands, edges of fields and meadows. They are active predators in and among wet debris, such as under leaves, compost heaps, and other decaying organic matter (Bohač, 1985b). This genus of more than 250 species is recognized from most tropical and temperate regions of the world, except Australia and New Zealand (Coiffait, 1984). The North American species have never been revised. Twelve species were listed from America north of Mexico by Moore & Legner (1975).

The three Palearctic species of *Rugilus* established in North America are here redescrbed and illustrated, new and old geographic records are recorded and mapped, and their native Old World distribution and bionomics are summarized. An evaluation of their adventive status in North

America is also provided. With two species names synonymized herein and *R. orbiculatus* newly recorded from the New World, the number of North American *Rugilus* now stands at 11 species.

### *Rugilus orbiculatus* (Paykull)

(Figs. 1- 4; Map 1)

*Staphylinus orbiculatus* Paykull, 1789:35. TYPE LOCALITY:Upland, Sweden. Type not examined.

*Stilicus latiusculus* Casey, 1884:39. TYPE LOCALITY:New York (Long Island). Lectotype, male, USNM (Washington, D.C.), here designated. NEW SYNONYMY.

*Stilicus oregonus* Casey, 1905:221. TYPE LOCALITY:Oregon (Albany). Holotype, female, USNM (Washington, D.C.). Type examined. NEW SYNONYMY.

*Rugilus orbiculatus* (Paykull) occurs widely throughout the western Palearctic region and is considered adventive in Australia (Horion, 1965; Coiffait, 1984). Specimens of *R. orbiculatus*, recently collected by the author in the Finger Lakes region of central New York, were confidently identified by examination of the male aedeagus.

A cursory inspection of other identified North American species of *Rugilus* revealed a very close

similarity between *R. orbiculatus* and two Casey species: *R. latiusculus* in eastern North America and *R. oregonus* in western North America. Study of the male aedeagus of these three taxa, including the type series of each, indicates that only one species is involved, the two Casey names becoming junior synonyms of *R. orbiculatus*.

**Redescription:** Habitus as in Fig. 1. Body generally blackish to black-pitch. Apical margins of elytra yellowish. Legs, tarsi, antennae, and mouthparts yellowish to reddish brown, with apices of femora, tibiae and last maxillary palpal segment more or less darkened, infusate. Length 3.5-4.5 mm.

Head, excluding mouthparts, as long as wide, posterior angles rounded, subtruncate at base. Temples as long as eyes. Eyes large, very prominent. Surface of head (Fig. 2) covered with umbilicate punctures, distinctly coarse, and more or less longitudinally confluent.

Pronotum longer than wide, with greatest width nearest anterior 1/4; surface covered with coarse, dense punctures, but generally not confluent, also with median, longitudinal band, smooth and glossy, finely furrowed at middle.

Elytra quadrate, slightly wider than head; surface glossy, covered with fine, moderately dense punctures.

Abdominal terga covered with very fine, dense punctation.

**Male:** Anterior tarsus feebly enlarged, as wide as apex of tibia. Abdomen: Sternum IV unmodified. Sternum V feebly sinuate at middle. Sternum VI deeply notched at middle. Aedeagus as in Figs. 3-4.

**Female:** Tarsi and apical abdominal sterna unmodified.

**Habitat:** This species occurs in most types of decaying organic matter, such as compost and grass heaps, rotting hay and straw, old mushrooms, hay stacks, leaves, and especially in leaf litter and other debris around water and damp habitats. Adults are found throughout the year (Boha, 1985b).

**Geographic Distribution:** Commonly encountered and widespread in the western Palearctic region, *R. orbiculatus* occurs in the British Isles (England, Scotland, Ireland), all of continental Europe, north Africa, the North Atlantic islands (Canary Islands, Azores, Madeira), Cyprus, Asia Minor, Caucasus, Transcaspian Region, and southern Siberia; it is an immigrant in Australia (Horion, 1965; Coiffait, 1984).

This species, now widely distributed in western and eastern North America (Map 1), shows a typical distribution pattern for an adventive species.

**Material Examined:** (311 specimens). **UNITED STATES:** **California:** *Lake Co.*, Lucerne, 30-VII-1955, H.B. Leech, 1 (CNCI). *Los Angeles Co.*, Burbank, 20-II-1936, C.H. Hicks, 1 (AMNH). *Riverside Co.*, Murrietta Hot Springs, 3-II-1984, L. Herman, 1 (AMNH). *San Diego Co.*, Lake Henshaw, 2725 ft., 9-III-1983, A. Smetana, 1 (CNCI). *Santa Cruz Co.*, Watsonville, 30-V-1932, F.E. Blaisdell, 1 (CNCI). *Sonoma Co.*, Petaluma, 22-III-1983, A. Smetana, 1 (CNCI). *Tehama Co.*, Red Bluff, 29-XI-1977, D.S. Chandler, 2 (FMNH). **Idaho:** *Bonner Co.*, Sandpoint, 23-VI-1986, N.M. Downie, 1 (FMNH); *Nez Perce Co.*, Webb, 2-III-1953, W.F. Barr, 1 (CNCI). **Illinois:** *Mason Co.*, Topeka, 17-VIII-1907, 1 (USNM); *Sangamon Co.*, Springfield, 15-IV-1927, 1 (FMNH). **Indiana:** *Porter Co.*, Ogden Dunes, 22-V-1928, 1 (FMNH). **Kansas:** *Douglas Co.*, Lawrence, 29-IX-1933, 1 (AMNH). **Massachusetts:** *Norfolk Co.*, Framingham, 27-IX-1945, C.A. Frost, 1 (FMNH); *Needham*, 23-IX-1928, F.E. Blaisdell, 1 (CNCI). **Michigan:** *Oakland Co.*, 20-IV-1930, A.W. Andrews, 1 (AMNH). **New York:** *Kings Co.*, Brooklyn, 1 (CUIC); *Flatbush*, III-1928, II-1921, R.P. Dow, 3 (CUIC); *Flatbush*, 11-V-1909, 1 (AMNH). *Monroe Co.*, Rochester, 9-IX-1933, 4-VI-1933, 30-VI-1933, R.L. Post, 7 (AMNH). *Suffolk Co.*, Orient, 10-IV-1943, 22-V-1941, R. Latham, 2 (CUIC). *Tompkins Co.*, Ithaca, 17-IV-1937, P. P. Babiy, 1 (CUIC); *Ithaca*, 28-VIII-1926, 1 (FMNH); *Town of Ulysses*, N. of Jacksonville, 19-V-1991, 10-V-1990, 14-X-1989, 1-XI-1985, 2-3/VIII-1992, 20-IV-1991, 20-V-1992, E.R. Hoebeke, 14 (CUIC); *Tompkins Co.*, 21-VIII-1958, N.M. Downie, 1 (CNCI). **Ohio:** *Franklin Co.*, Columbus, OSU waste facility, 15-VII-1978, L.E. Watrous, 3 (FMNH). **Oregon:** *Benton Co.*, Albany, 15-VII-1922, Wickham, 1 (USNM); *Corvallis*, 8-IX-1929, H.A. Scullen, 1 (CNCI). *Clarkamas Co.*, Boring, 13-III-1947, J. Schuh, 1 (CNCI); *Camp Crk.*, Campgr., 2.8 mi. SE

Rhododendron, 2300 ft., 1-VII-1974, A. & D. Smetana, 1 (CNCI). *Columbia Co.*, Oak I. of Sauvies I. Columbia R., 5 Mi. N. 2 mi. E. Burlington, 300 ft., 7-X-1972, E.M. Benedict, 6 (CNCI); Scapoose, 3-III-1936, Gray & Schuh, 1 (AMNH). *Coos Co.*, Charleston, 24-V-1957, H.S. Dybas, 9 (FMNH); Charleston, 15-VIII-1947, I.M. Newell, 5 (AMNH); Marshfield, 10-VIII-1941, 1 (FMNH). *Deschutes Co.*, Redmond, 27-V-1939, Gray & Schuh, 1 (AMNH). *Douglas Co.*, Smith River, 5.5 mi. NE Reedsport, 29-VI-1978, L. Herman, 1 (AMNH). *Grant Co.*, John Day (12 mi. S.), 31-V-1957, H.S. Dybas, 1 (FMNH). *Hood River Co.*, 3 mi. SE Odell Lake, 8-VI-1941, Schuh & Gray, 1 (AMNH). *Jackson Co.*, Hwy. Ore. 234, app. 9 mi. N. Central Pt., 22-I-1972, 1400 ft., E.M. Benedict, 2 (CNCI). *Klamath Co.*, Geary Canal, 10-V-1978, J. Schuh, 1 (AMNH); Klamath Falls, 18-III-1962, 6-V-1955, 8-II-1959, 26-IX-1966, J. Schuh, 6 (AMNH, FMNH). *Lane Co.*, Eugene, 24-V-1957, B. Malkin, 5 (FMNH); Cox Butte Rd., approx. 4 mi. NE Cheshire, 400 ft., 4-XII-1971, E.M. Benedict, 1 (CNCI); Eugene, 10-IV-1942, 20-V-1942, 2 (FMNH); Glenada, VI-1946, 23-VI-1941, 16-VII-1941, 7-VI-1957, H.S. Dybas, 5 (AMNH, FMNH). *Tillamook Co.*, 5 mi. SE Blaine, Jct. Blaine & For. Ser. Rd., 500 ft., 15-III-1972, E. M. Benedict, 2 (CNCI). *Washington Co.*, Forest Grove, 14-IV-1941, K.M. Fender, 29 (AMNH, FMNH). *Yamhill Co.*, McMinnville, 10-XII-1940, 6 (USNM); McMinnville, 11-VI-1957, H.S. Dybas, 2 (FMNH); McMinnville, 12-X-1940, K. M. Fender, 1 (FMNH); approx. 2 mi. S. Yamhill, 200 ft., 1-I-1972, E.M. Benedict, 3 (CNCI). **Pennsylvania:** *Lehigh Co.*, Bethlehem, 2 (FMNH); Easton, 23-V-1915, J.W. Green, 1 (FMNH). **Utah:** *Box Elder Co.*, Mantua, 22-IV-1939, Knowlton & Bischoff, 1 (USNM). **Washington:** *King Co.*, Bothell, 28-IV-1960, D. Miller, 1 (AMNH); Seattle, 11-IV-1954, 7-V-1954, B. Malkin, 12 (FMNH); Seattle, 28-IX-1944, H.S. Dybas, 3 (FMNH). *Walla Walla Co.*, College Place, 15-IV-1949, G.H. Nelson, 3 (USNM); Walla Walla, 17-31/III/1941, H.P. Lanchester, 1 (USNM). *Whitman Co.*, Palouse, 6-V-1949, N.M. Downie, 2 (FMNH); Pullman, 18-III-1951, 24-III-1951, 3-IV-1951, 2-X-1948, 14-V-1946, N.M. Downie, 5 (CNCI, FMNH).

**Canada: British Columbia** (no counties): Agassiz, 7-III-1931, H. Leech, 2 (CNCI, AMNH); Bowser, 29-V-1955, 16-VI-1955, 21-VI-1955, W.J. Brown, 3 (CNCI); Creston, 21-IX-1954, 3-IV-1955, 8-IV-1956, 19-IV-1956, 29-V-1956, G. Stace Smith, 28 (CUIC); Creston, 2-X-1944, G. Stace Smith, 3 (FMNH); Creston, 14-IV-1980, 2-VII-1981, I. Askevold, 5

(CNCI); Essondale, VI-1968, W. Lasorko, 1 (FMNH); 12 mi. E. Hope, 2-VI-1968, Campbell & Smetana, 1 (CNCI); Kelowna, 22-IX-1931, R.D. Bird, 1 (CNCI); Penticton, 9-IX-1931, 25-VIII-1931, 21-22/IX/1931, R.D. Bird, 8 (CNCI); Queen Charlotte Isl., Q. C. City, 16-VII-1983, J.M. Campbell, 17 (CNCI); Riber Jordan, 24-VII-1975, J.M. Campbell, 1 (CNCI); Royal Oak, V. Is., 10-V-1958, J. Argyle, 1 (CUIC); Salmon Arm, 30-IV-1931, 25-III-1932, 20-IV-1932, 3-III-1934, 21-III-1934, H.B. Leech, 9 (CUIC); Summerland, 10-XII-1931, 10-XII-1931, 1-IV-1932, A.N. Gartrell, 8 (CNCI); Terrace, M.E. Hipsley, 1 (AMNH); Tsawwassen, 19-V-1968, Campbell & Smetana, 5 (CNCI); Vancouver, 15-IX-1981, E.J. Kiteley, 1 (CNCI); Vancouver, 22-II-1933, 28-IX-1932, H.B. Leech, 4 (CNCI); Vancouver, 11-III-1932, K. Graham, 1 (CNCI); Vancouver, 10-V-1931, 10-X-1931, 21-IV-1931, 14-III-1931, 22-II-1933, H.B. Leech, 5 (AMNH, CNCI); Vernon, 3-IX-1931, 2-XI-1931, R.D. Bird, 2 (CNCI); Vernon, 11-VII-1929, 2-I-1935, H.B. Leech, 4 (CNCI, SEMC); Vernon, 18-IV-1929, 1 (CNCI). **Ontario:** *Carleton Co.*, Ottawa, 17-IX-1957, A.T. Howden, 1 (CNCI); South March, X-1967, J.M. Campbell, 1 (CNCI). *Kent Co.*, Chatham, 19-VIII-1928, 22-VIII-1928, 23, 25-VIII-1928, A.B. Baird, 4 (CNCI); Rondeau Prov. Pk., Lakeshore Rd., 5-VI-1985, A. Davies, J.M. Campbell, 2 (CNCI). *Lincoln Co.*, Vineland Sta., 7-VI-1928, W. Putman, 1 (CNCI). *Prince Edward Co.*, no locality, 26-III-1952, 22-III-1953, 9-IV-1952, 14-X-1951, 11-XI-1951, J.F. Brimley, 13 (CNCI).

**Remarks:** With the North American *R. latiusculus* and *R. oregonus* synonymized with the widespread Palearctic *R. orbiculatus*, the question of its North American origin is raised.

Most available second-hand evidence — current geographic pattern, abundance, and ecology — suggests that *R. orbiculatus* is adventive in North America, probably having been accidentally transported in commerce. In fact, Lindroth (1957:187) recorded *R. orbiculatus* (cited as *Stiliculus*) in a list “of animals on the ballast-places of SW England.” The British Isles, specifically southwestern England, have been implicated “as the main region of departure for animals which have been unintentionally introduced from Europe into North America” (Lindroth, 1957:172). Using ground beetles (Carabidae) for his chief body of evidence, Lindroth convincingly demonstrated that New England (and the Canadian Maritime provinces) served “as a gateway for European introductions...,” and that

the Pacific Northwest also was (and is) an "important reception area for European introductions."

From an ecological perspective, the evidence also points toward an immigrant status for *R. orbiculatus* in North America. This paederine staphylinid is terricolous or ground-dwelling, mesophilous (possessing intermediate moisture requirements), and is generally found on waste ground — three important attributes that favor success or survivability during transport in ballast (Lindroth, 1957).

Another biogeographic hypothesis, however, should be considered. That *R. orbiculatus* is also recorded from Alaska (Bousquet, 1991, cited as *oregonus*) suggests this and other Pacific Northwest populations are indigenous. But the north-eastern populations could also suggest multiple introductions into eastern North America and may better explain such a disjunction in its Nearctic distribution. Additional collecting may reveal a transcontinental distribution in northern United States and Canada, thus providing further evidence for an indigenous, or naturally Holarctic, origin in North America. However, the absence of this species from key Beringian or far eastern Palearctic regions (only western and central Europe) weakens the possibility of a naturally Holarctic origin.

Lawrence, Kansas (1933), the westernmost population of *R. orbiculatus* in the East, is separated from the nearest western populations at Mantua, Utah (1939) by at least 1512 kilometers (or 937 miles). This "disjunct" distribution pattern would be best explained by a theory of early, multiple introductions into western and eastern North America.

### *Rugilus rufipes* Germar

(Figs. 5-9; Map 2)

*Rugilus rufipes* Germar, 1836:4. TYPE LOCALITY: Austria. Type not examined.

This widespread Palearctic species was previously recorded in North America from Washington state (Moore and Legner, 1975:136) and, more recently, from Ontario (Bousquet, 1991).

Kellner and Dettner (1992) resurrected the genus *Stilicosoma* from synonymy with *Rugilus*. They considered that the type species of *Stilicosoma* (*R. rufipes*) does not belong to *Rugilus* on the basis

of its divergent general habitus, the presence of 4 labral denticles (in contrast to 2 in *Rugilus* s. str.), and an accumulation of pores at sternite 4 (in contrast to median glands at sternites 4 and 5 in *Rugilus* s. str.). However, pending a comprehensive revision of the Nearctic species, I shall recognize *rufipes* in the genus *Rugilus*.

**Redescription:** Habitus as in Fig. 5. Body rather robust and uniformly dark reddish brown to black. Legs, antennae, and mouthparts pale reddish brown. Length 6.0-6.5 mm.

Head, excluding mouthparts, slightly wider than long; posterior angles broadly and obtusely rounded; posterior margin truncate. Temples slightly longer than eyes. Surface of head (Fig. 6) uniformly covered with dense, coarse, more or less confluent, punctures.

Pronotum slightly longer than wide, its greatest width at about 1/5 from anterior margin, lateral margins beyond middle slightly convergent to base, abruptly narrowed at posterior angles. Surface uniformly covered with punctation resembling that of head; with a broad, smooth, slightly raised, median band in posterior 3/4.

Elytra slightly longer than wide, and wider than head. Surface uniformly covered with fine, dense punctures, slightly finer at apical margin.

Abdomen uniformly finely and densely punctured.

**Male:** Anterior tarsus feebly enlarged, slightly wider than apex of tibia. Abdomen: Sternum IV unmodified. Apical margin of visible sternum V slightly sinuate at middle. Sternum VI moderately deeply notched (Fig. 7). Aedeagus as in Figs. 8-9.

**Female:** Tarsi and apical abdominal sterna unmodified.

**Habitat:** In the Palearctic region, *R. rufipes* inhabits both dry and wet habitats, such as meadows, fields, forests, forest-steppe, hilly steppe and heath land, living among decaying organic matter, compost heaps, under stones, and leaves. Adults occur throughout the year, with peak occurrence in the spring and autumn (Bohac, 1985b).

**Geographic Distribution:** Widely distributed throughout western Europe (Horion, 1965; Coiffait, 1984), *R. rufipes* is known from Scotland, England (Joy, 1932), Norway, Sweden, Finland, France

(Portevin, 1929), Germany, Austria, Hungary, Turkey, Russia, Caucasus, Siberia, Spain, Italy (Porta, 1926), and Sicily (Borchert, 1938).

In North America, *R. rufipes* shows a limited distribution pattern in the Northeast (Map 2); a record from the Pacific Northwest (Washington) is unconfirmed (Moore and Legner, 1975).

**Material Examined:** (19 specimens). CANADA: **Ontario:** *Waterloo Co.*, Elmira, 1-VI-1985, A. Davies & J. Campbell, 2 (CNCI). *York Co.*, Markham, 17-24/V/1980, R.S. Anderson, 3 (CNCI). **Quebec:** *Gatineau Co.*, Gatineau Pk., 15-22/V/1987, J. Denis & J. Huber, 1 (CNCI); Gatineau Pk., nr. Pinks Lk., 24-VI-1979, Peck & Davies, 1 (CNCI); Gatineau Pk., Hull-Ouest, 30-VI/6-VII-1982, E. Rickey & L. LeSage, 1 (CNCI); Gatineau Pk., Hull-Ouest, 15-22/VI/1982, Rickey & LeSage, 1 (CNCI); Lucerne, 5-12/VI/1982, L. LeSage, 1 (CNCI); Lucerne, 6-XI-1982, L. LeSage, 1 (CNCI); Old-Chelsea, 30-X-1987, A. Davies, 1 (CNCI). *Ile-de-Montreal Co.*, Dollard-des-Ormeaux, 24-VI-1982, L. LeSage, 1 (CNCI); Montreal, 21-VI-1981, 25-VII-1971, 14-VI-1983, 3-VI-1980, E.J. Kiteley, 4 (CNCI); Montreal, Mont-Royal, 23-IX-1987, L. LeSage, 2 (CNCI).

**Remarks:** In Czechoslovakia and elsewhere in western Europe, *R. rufipes* (like *R. orbiculatus*) is considered to have a "wide ecological valence" (Bohac, 1985a:364) and capable of inhabiting "both moist and dry habitats of different types and ... (is) typical also of cultivated fields and ruderals." This ecological evidence, its "ubiquitous species" status (Bohac, 1985a), its limited "disjunct" pattern in North America, as well as its partly synanthropic habits, clearly support an adventive status in North America.

### *Rugilus fragilis* (Gravenhorst)

(Figs. 10-14; Map 3)

*Staphylinus angustatus* Fourcroy, 1785:172. TYPE LOCALITY: Paris environs. Type not examined. Preoccupied by *Staphylinus angustatus* Schrank, 1781:233 (Pope, 1977:28).  
*Paederus fragilis* Gravenhorst, 1806:140. TYPE LOCALITY: Paris. Type not examined.

Because of its unique coloration (i.e., reddish-orange pronotum contrasting with dark reddish-brown to piceous body), large size (5.5-6.5 mm), and

distinctive (visible) male abdominal sterna IV-VI and aedeagus, this adventive species is not likely to be confused with any other described North American *Rugilus*.

Recently, I collected a short series of specimens in central New York at a windowpane of an outdoor shed. Upon further inspection of sorted and unsorted Staphylinidae in the Cornell University Insect Collection (CUIC), additional specimens were discovered. Initially, they could not be accurately assigned to any described or recorded species of North American *Rugilus*; further investigation soon proved these specimens to be conspecific with examples of the Palearctic *R. fragilis* (= *angustatus* of most European authors). An examination of the identified and unidentified staphylinids in the Canadian National Collection of Insects, Ottawa (CNCI) revealed additional specimens, which undoubtedly represented the basis for the Canadian records reported in Bousquet (1991).

**Redescription:** Habitus as in Fig. 10. Head, elytra, and abdomen dark reddish brown, piceous, or blackish. Apical margin of elytra pale testaceous. Humeri, sometimes elytral bases, and extreme base of head narrowly brown-ocher. Pronotum usually orange or reddish. Legs, antennae, and mouthparts reddish brown. Length 5.5-6.5 mm.

Head, excluding mouthparts, slightly longer than wide, posterior angles very broadly rounded. Temples nearly 2 x longer than eyes. Surface of head (Fig. 11) uniformly covered with coarse, dense, and more or less confluent punctures, slightly polished.

Pronotum oblong, not quite as wide as head, its greatest width slightly in front of middle. Surface uniformly covered with prominent punctures, but slightly coarser, and little less dense than on head; smooth, median band lacking punctures, very finely grooved along midline.

Elytra slightly longer than wide, distinctly broader than head, uniformly covered with coarse, dense punctures; punctures very fine along posterior margin.

Abdomen somewhat polished, covered with very fine, dense punctures.

**Male:** Anterior tarsus scarcely enlarged, narrower than apex of tibia. Abdomen: Sternum IV at middle of apical margin with smooth and glossy, small, flat, reddish tubercle, surrounded by fringe of long setae (Fig. 12). Sternum V with distinct, large, deep

and polished impression (Fig. 12). Sternum VI bluntly, triangularly notched (similar to Fig. 7). Aedeagus as in Figs. 13-14.

**Female:** Tarsi and apical abdominal sterna unmodified.

**Habitat:** Throughout the Palearctic region, *R. fragilis* occurs along banks of watercourses and in meadows, forest borders, living under decaying organic matter, such as leaves. In Europe, adult incidence attains two peaks — March to June, and October to December (Bohač 1985).

**Geographic Distribution:** *Rugilus fragilis* is common throughout western Europe (Horion, 1965), known from southern England (Joy, 1932), Holland, Belgium, France (Portevin, 1929), Germany, Austria, Poland, Switzerland, Hungary, Czechoslovakia, Spain and Russia (Borchert, 1938), Greece (Oertzen, 1886), Corsica, Sardinia, Sicily, and Italy (Porta, 1926), and Finland and Sweden (Palm, 1963).

The species is probably adventive in eastern North America (Ontario, Quebec, Nova Scotia, Maine, New York) (Map 3), with the earliest known collection from Prince Edward County, Ontario, April 1950.

**Material Examined:** (34 specimens). CANADA: **Nova Scotia:** *Victoria Co.*, Cape Breton H.N.P., 12 m, 2 Km N. Ingonish Bch., 27-IX-1984, J.M. Campbell, 2 (CNCI). **Ontario:** *Carleton Co.*, Leitrim, 11-V-1985, B. Skidmore, 1 (CNCI); Ottawa, forest W. Kanata, 5-VI-1984, L. Masner, 4 (CNCI). *Prince Edward Co.*, no locality, 30-IV-1950, J.F. Brimley, 2 (CNCI). **Quebec:** *Gatineau Co.*, Aylmer-Lucerne, 7-VI-1979, A. Smetana, 1 (CNCI); Gatineau Park, nr. Mud Lake, 24-X-1967, A. Smetana, 1 (CNCI); Gatineau Pk., Lac Philippe, 1-IX-1968, J.M. Campbell, 1 (CNCI); Gatineau Pk., 28-IV-1987, J. Denis & A. Davies, 3 (CNCI); Gatineau Pk., Fortune Lake, 7-XI-1967, J.M. Campbell, 1 (CNCI); Gatineau Pk., 1 mi. SW Meach Lake, 22-VI-1967, J.M. Campbell, 1 (CNCI); 4 mi. W. Masham, nr. Mud Lake, 17-VIII-1967, J.M. Campbell, 2 (CNCI); Old-Chelsea, 30-X-1987, A. Davies, 2 (CNCI). *Île-de-Montreal Co.*, Montreal, 13-V-1975, 30-VI-1969, E.J. Kiteley, 2 (CNCI). *Laprairie Co.*, Ste-Catherine, 9-VI-1964, J.-C. Aube, 1 (CNCI). *Lévis Co.*, Dosquet, 9-VI-1970, C. Chantal, 4 (CNCI, FMNH).

UNITED STATES: **Maine:** *Cumberland Co.*, Westbrook, 12-V-1980, D. Jump, 1 (AMNH). **New**

**York:** *Tompkins Co.*, Ithaca, Snyder Heights, 9-V-1979, J.G. Franclemont, 1 (CUIC); Ithaca, Perry City Rd., 26-IV-1990, G. Swenson, 1 (CUIC); N. Lansing, 30-V-1983, N.M. Downie, 1 (FMNH); Town of Ulysses, N. of Jacksonville, 20-V-1992, E.R. Hoebeke, 4 (CUIC).

**Remarks:** With little doubt, *R. fragilis* was unintentionally introduced into eastern North America with early commerce. New records from other eastern Canadian localities, as well as new localities in the eastern United States (Maine and New York), document the establishment and range expansion of this adventive species.

### Acknowledgments

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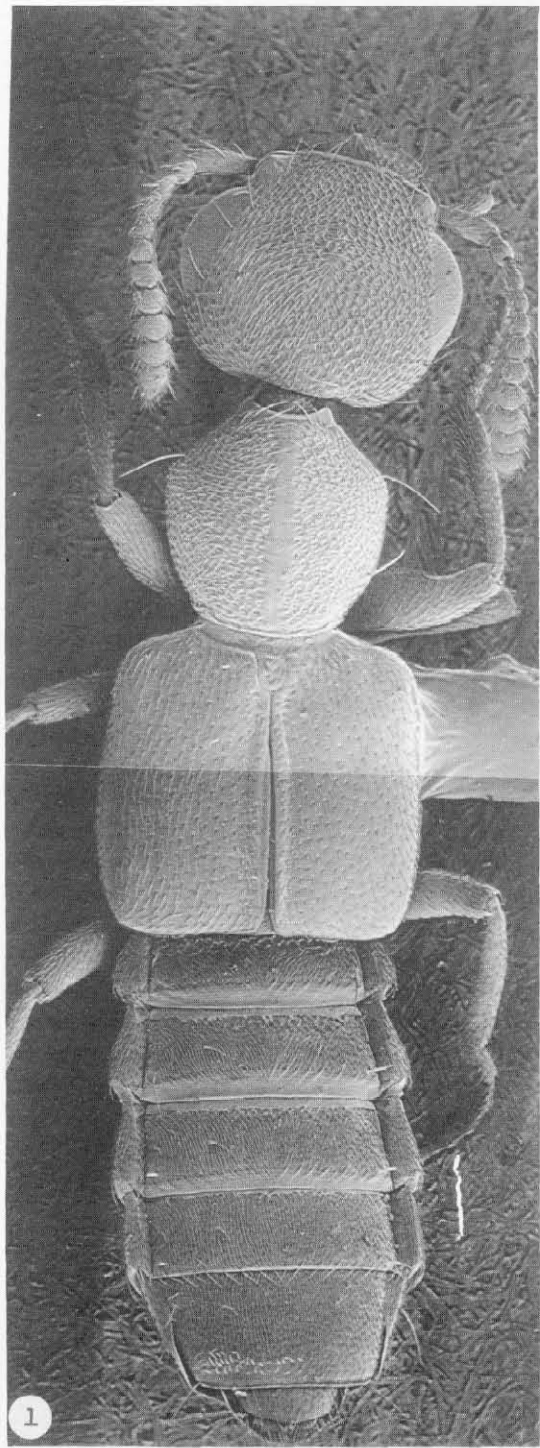
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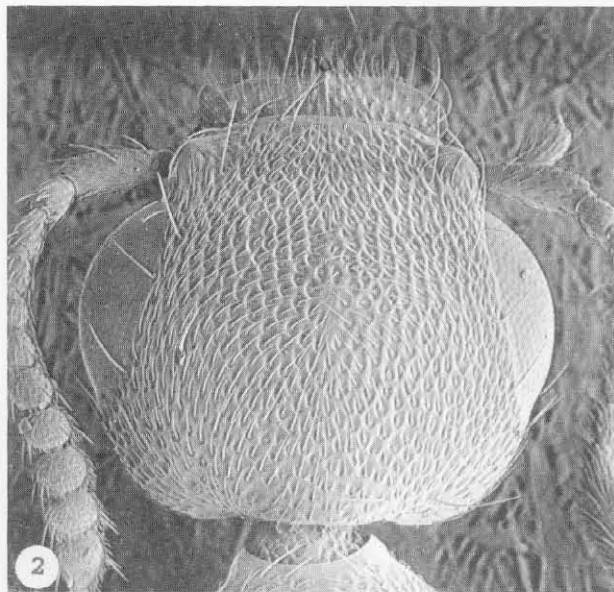
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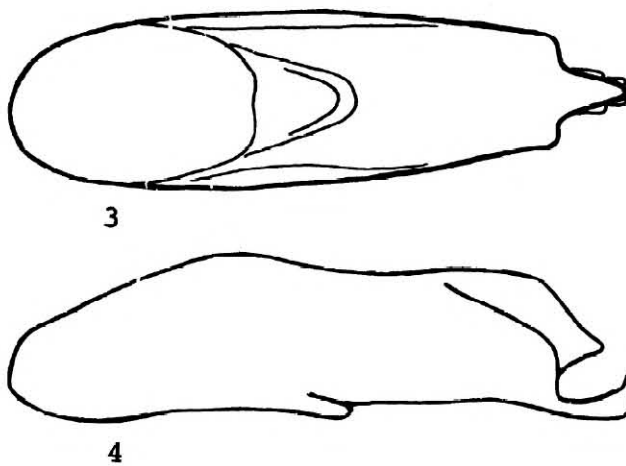




**Fig. 1:** *Rugilus orbiculatus* (Paykull). Dorsal habitus, composite scanning electron photomicrograph, 49X.



**Fig. 2:** *Rugilus orbiculatus* (Paykull). Head, dorsal aspect, 65X.



**Figs. 3-4:** *Rugilus orbiculatus* (Paykull). 3. Aedeagus, ventral aspect. 4. Aedeagus, lateral aspect.

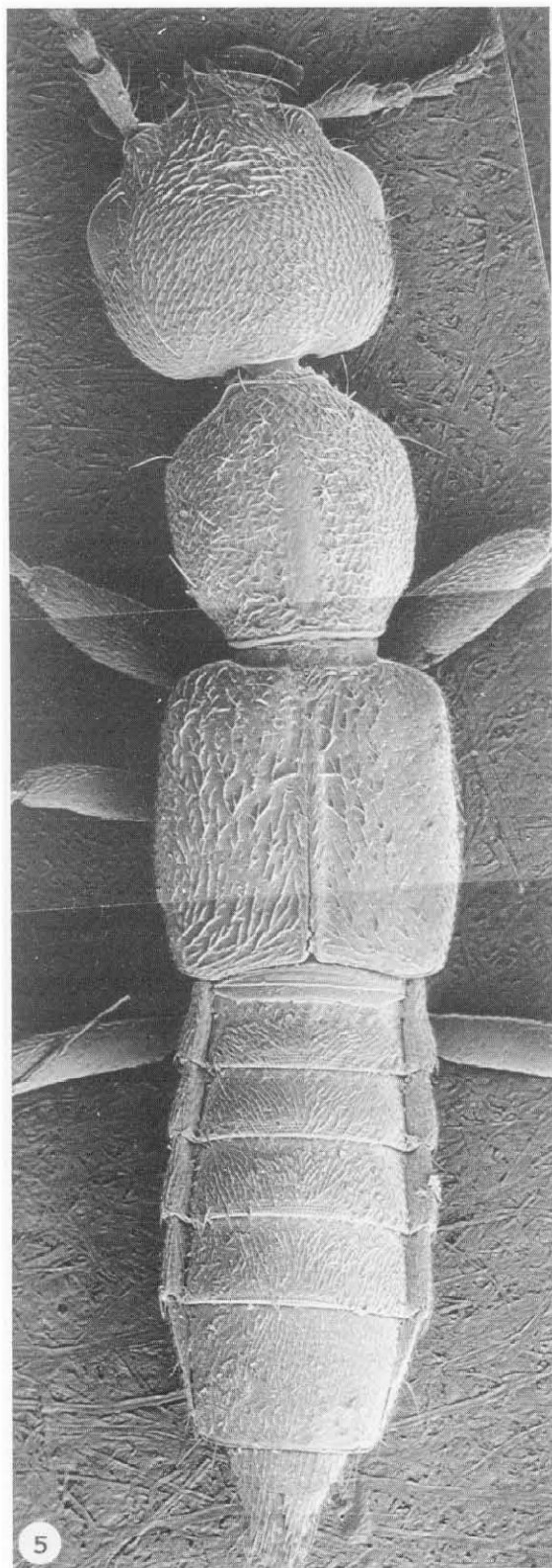
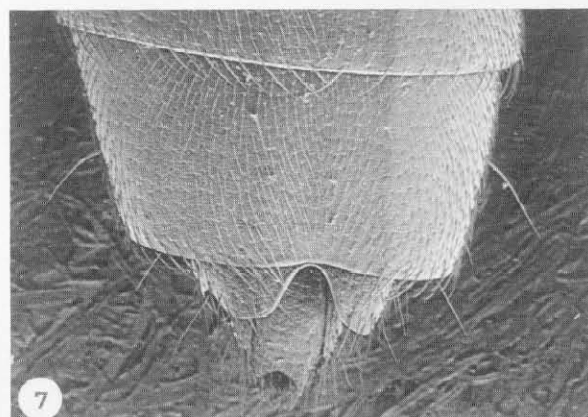
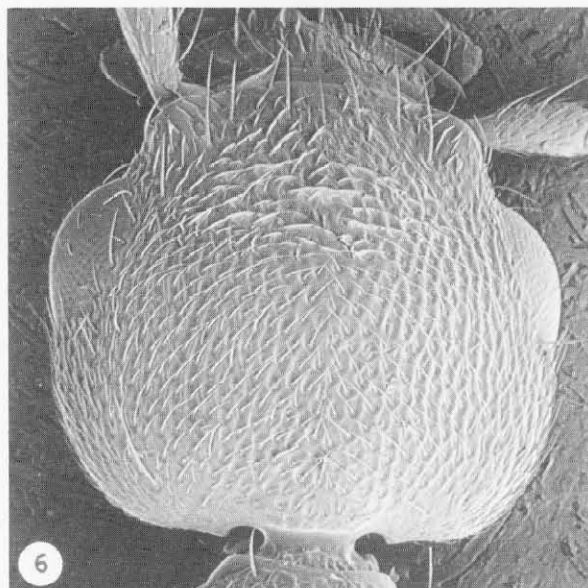
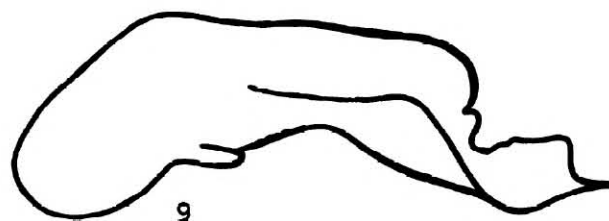
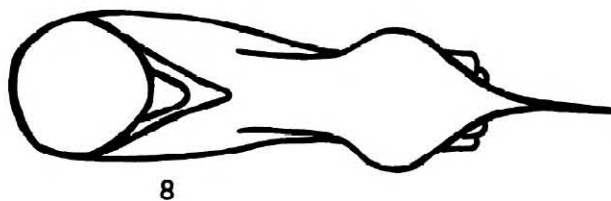


Fig. 5: *Rugilus rufipes* Germar. Dorsal habitus, composite scanning electron photomicrograph, 48X.



Figs. 6-7: *Rugilus rufipes* Germar. 6. Head, dorsal aspect, 75X. 7. Abdominal sterna IV-VI, male, 65X.



Figs. 8-9: *Rugilus rufipes* Germar. 8. Aedeagus, ventral aspect. 9. Aedeagus, lateral aspect.

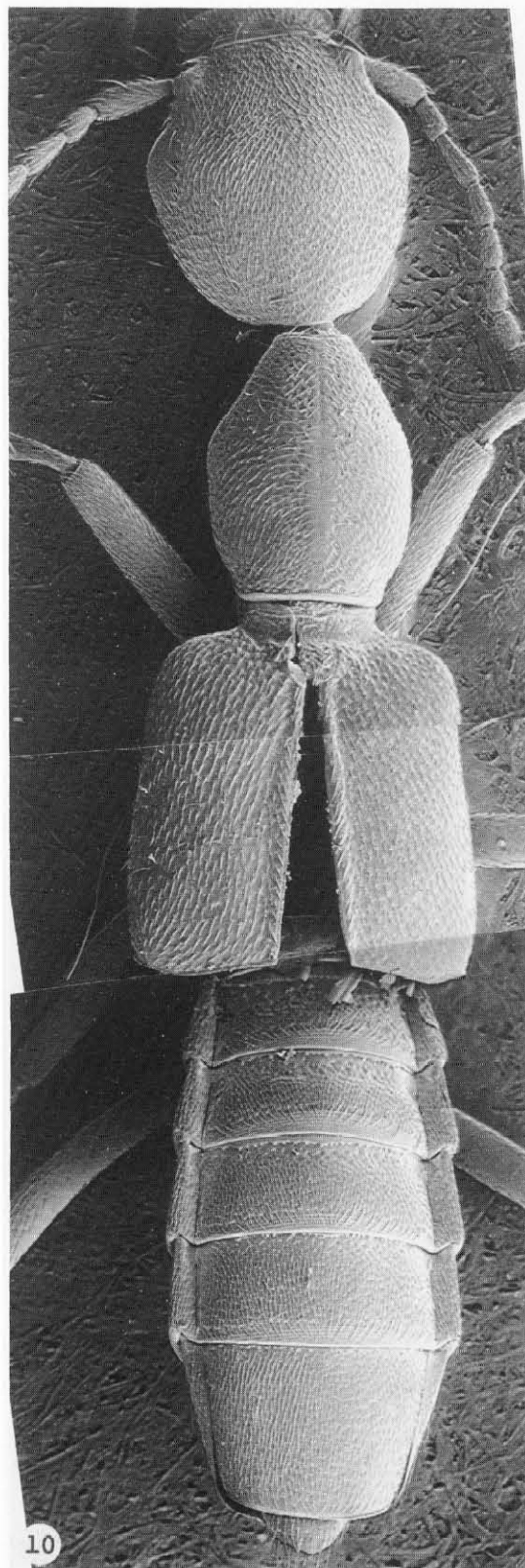
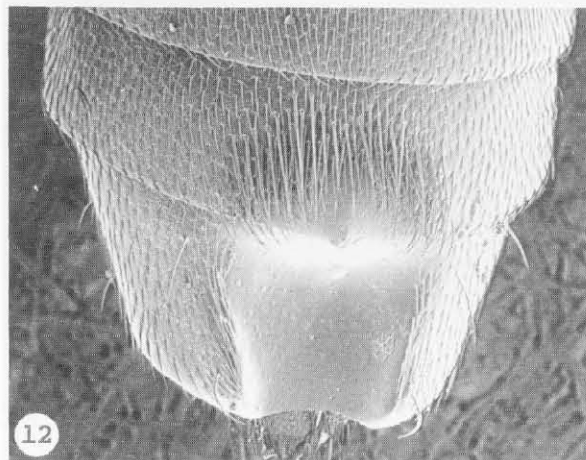
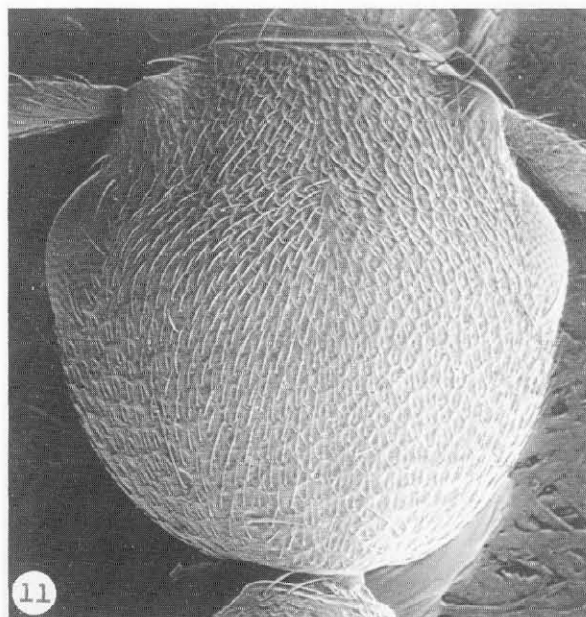
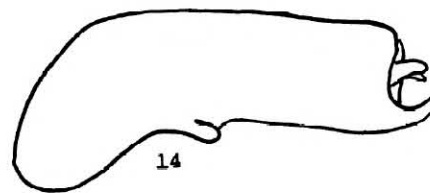
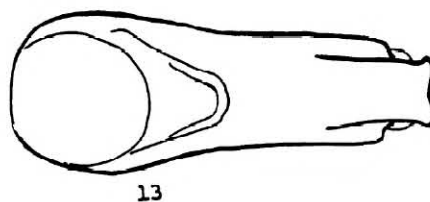


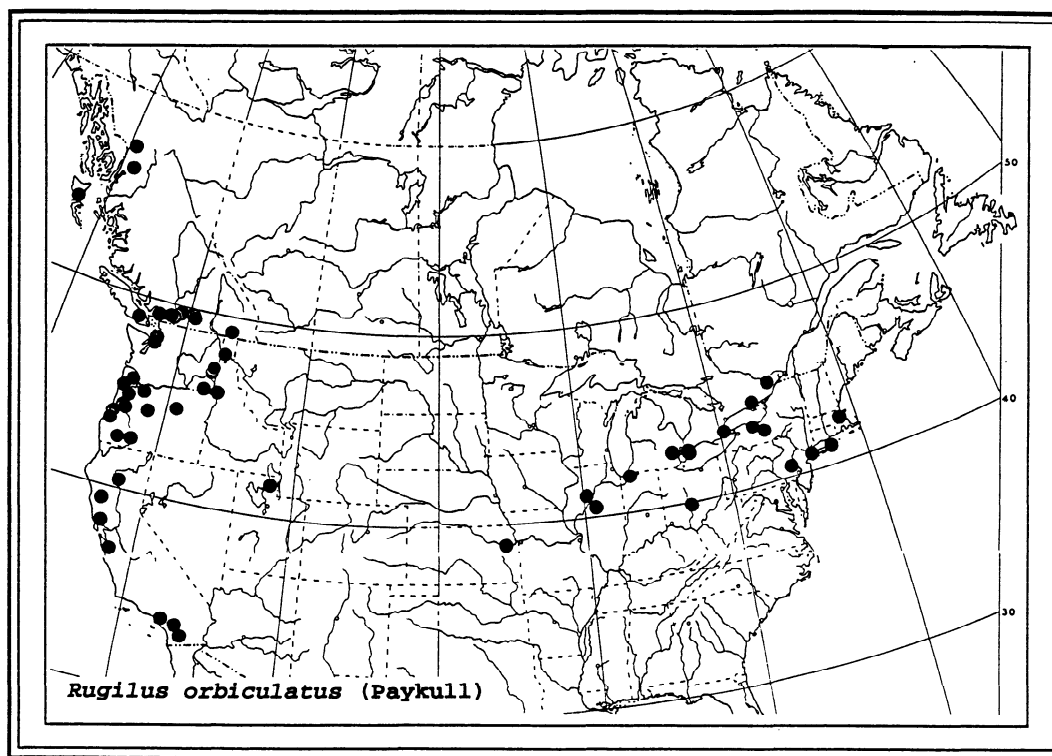
Fig. 10. *Rugilus fragilis* (Gravenhorst). Dorsal habitus, composite scanning electron photomicrograph, 48X.



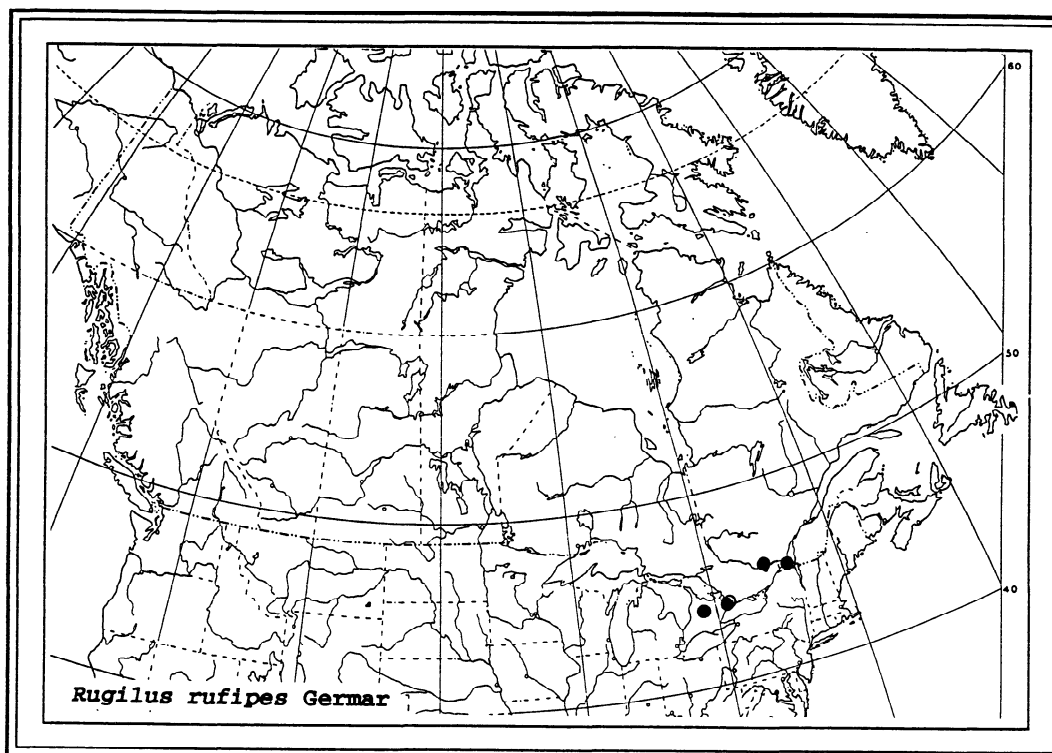
Figs. 11-12: *Rugilus fragilis* (Gravenhorst). 11. Head, dorsal aspect, 94X. 12. Abdominal sterna III-V, male, 65X.



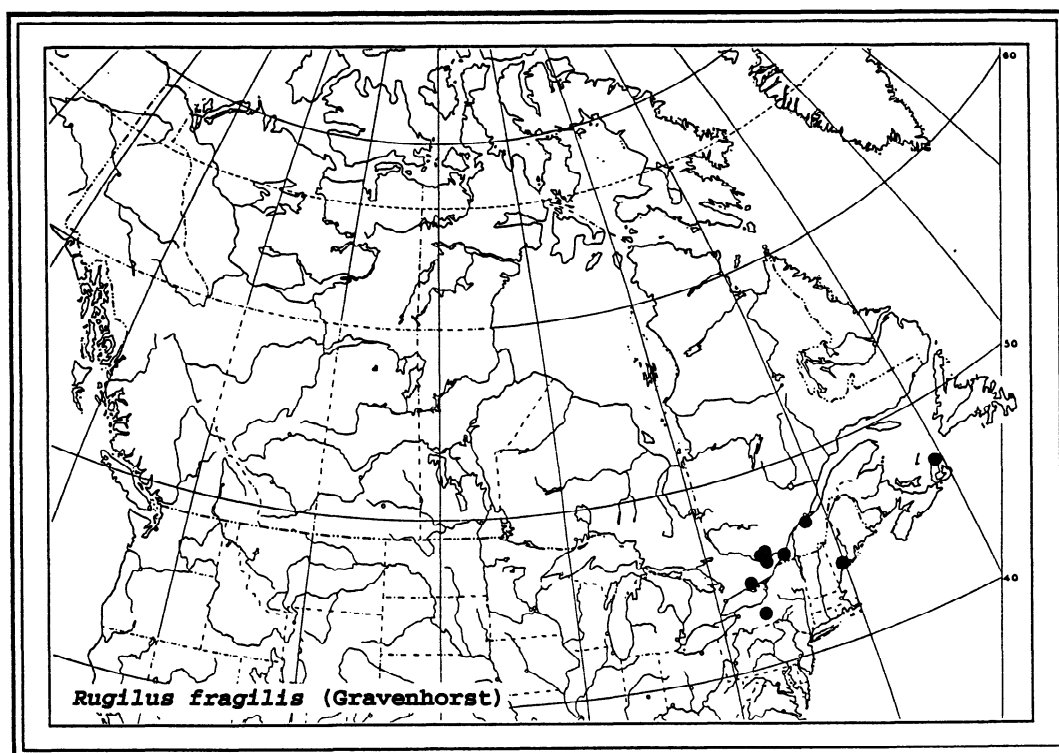
Figs. 13-14: *Rugilus fragilis* (Gravenhorst). 13. Aedeagus, ventral aspect. 14. Aedeagus, lateral aspect.



Map 1: Known North American distribution of *Rugilus orbiculatus* (Paykull).



Map 2: Known North American distribution of *Rugilus rufipes* Germar.



Map 3. Known North American distribution of *Rugilus fragilis* (Gravenhorst).