ABSTRACT—A key, illustrations, distributions, and host records are given for 16 species of *Otiorhynchus* (Coleoptera: Curculionidae) known or believed to be established in North America.

Of the thirty-nine or more genera of alien weevils that are known or believed established in America north of Mexico the genus *Otiorhynchus* has the largest number of species (Lindroth, 1957). Essig (1933) reported seven species in North America, including five in California.

The economic importance of *Otiorhynchus* in North America is well documented. The majority of the species, all Palearctic, are serious pests of cultivated plants, in both their native country and in North America. The adults are flightless, and the larvae feed underground; several species are known to be parthenogenetic. In Europe males of all species have been described, but only those of *ligneus* (Olivier), *meridionalis* Gyllenhal and *poreatus* (Herbst) have been found in North America.

We are presenting a key to the species, illustrations, distribution maps and tables giving the most important host plants for sixteen species known or believed to be established in North America. One species, *auricapillus* Germar, is not included. This European species was reported to have been introduced with imported nursery stock at Cromwell, Connecticut (Leng, 1916; Blatchley and Leng, 1916:112). No subsequent records have been found, nor have we seen the original specimens.

*Otiorhynchus* Germar

Oval, varying from black, to reddish black, to grey or brown. Rostrum stout, apex notched and extremely dilated to form a pterygium; mandibles large, with prominent scar; scrobes vaguely defined posteriorly. Antennal scape long, when retracted next to head usually passing middle of eye and attaining thorax; funicle 7-segmented. Eyes round. Prothorax oval, truncated anteriorly and posteriorly.

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1 In North America this genus has been known as *Brachyrhinus*. A ruling of the International Commission on Zoological Nomenclature has validated the name *Otiorhynchus*. (Bull. Zool. Nomenclature, V. 29(1), May 1972:19.

Scutellum very small or indistinct. Elytra oval to oblong. Protibia usually arched; femur clavate, with or without teeth. Wingless; elytra united.

The distinctive feature of this genus is the pterygium, as shown in fig. 3, 8. Most species are shiny, glabrous, black or dark red. They are nocturnal and their movements are generally slow. They move and feed during the warm nights of spring, summer and fall. The winter is passed largely in the larval stage, but adults may also hibernate in warmer regions. The larvae live in the soil and feed upon the roots and underground stems of plants. Pupation occurs in the soil.

### Key to Species

1. Apex of tibia I expanded dorsally (fig. 33) ........................................... 2
   — Apex of tibia I rounded dorsally (fig. 34) ........................................... 3

2. Femora toothed. Body dull, with numerous small, appressed, greyish or yellowish scales and setae covering elytra. Elytra finely granulate over entire surface, striae very fine. Prothorax covered with large, flat tubercles. Rostrum long, slender, without median furrow, with sharp median carina from base to raised V-shaped, emargination at apex (fig. 1, 17). Black. Length: 10–12 mm .............................. *ligustici* (Linnaeus)

   — Femora not toothed. Body shiny, without scales, with semierect, short hairs in single row on each elytral interval and shorter hairs from each stria puncture. Prothorax densely punctured, punctures large, each with a fine hair. Rostrum short, broad, with deep subtriangular furrow which is wider at apex than at base, with lateral margins raised, converging posteriorly and attaining the eyes (fig. 2, 18). Blackish brown. Length: 7–8 mm ............................................... *cribricollis* Gyllenhal

3. Femora not toothed ................................. 4

   — Femora 1 and 3 toothed ......................... 12

4. Elytra with scales ........................................................................ 5

   — Elytra without scales, hairs only ................................................. 8

5. Alternate elytral intervals raised .................................................... 6

   — All elytral intervals flat .......................................................... 7

6. Alternate elytral intervals strongly raised, tuberculate, with short curved seta from each tubercle; even intervals flat; striae punctures large, deep; elytra, prothorax, and rostrum with short, narrow, greenish scales condensed in scattered spots and generally distributed. Prothorax tuberculate, coarsely granulate; medially impressed from base to apex, impression with thin line of greenish scales. Rostrum with broad median furrow and lateral carina from base almost to antennal insertions; apex with elevated, broad, shiny carina (fig. 3, 19). Brownish black. Length: 4–5 mm .............................. *porcatus* (Herbst)

   — Alternate elytral intervals weakly raised, each with row of long, club-shaped, semierect setae; even intervals flat; striae punctures large, each covered with round scale. Elytra mottled with submetallic, tan and brown, round, appressed scales. Prothorax with only tan scales; densely punctured. Rostrum dorsally convex, without median furrow or carina,
densely covered with tan scales and setae to antennal insertions; bare from insertions to apex (fig. 4, 20). Brown. Length: 4–6 mm..............

7. Elytral intervals completely covered with yellow-brown and grey-brown submetallic, striate, attenuate scales; strial punctures large, diminishing in size to apex. Prothorax on disc densely puncto-tuberculate, tubercles smooth; with smooth shiny, simious, median carina; laterally tubercles densely punctured, dull, coalescing, each puncture with long brown seta; large, attenuate greenish scales generally distributed over disc. Rostrum rugosely punctured, with median carina from frontal fovea to raised emarginated apex, apex depressed each side of carina; vestiture of brown setae and greenish scales (fig. 5, 21). Brownish black. Length: 6–7 mm scaber (Linnaeus)

— Elytra shiny, vestiture sparse, fine hairlike golden scales serially arranged on each interval, with scattered patches of broader scales. Prothorax on disc, with low, smooth, shiny tubercles, tubercles becoming smaller and coarser laterally, without median carina; vestiture fine, sparse. Rostrum densely, coarsely punctured from base to apex, with broad, dull, finely punctured median carina from frontal fovea to antennal insertions. Black, antennae and legs red to reddish black (fig. 6, 22). Length: 7–8 mm raticus (Fabricius)

8. Rostrum with median longitudinal carina
   — Rostrum without median longitudinal carina 10

9. Rostrum elongate, nearly glabrous, deeply furrowed on each side of median carina; Y-shaped median carina enclosing triangular, glabrous area at apex (fig. 7, 23). Elytra elongate oval, puncto-rugose on disc and finely granulate on sides and apex; very short, stiff, semierect grey hairs generally distributed. Prothorax granulate or puncto-granulate, or only punctured. Brownish black. Length: 7–10 mm meridionalis Gyllenhal
   — Rostrum a little longer than wide, dull, with very sparse, fine, white hairs, densely punctured on each side of median longitudinal carina (fig. 8, 24). Elytra convex, oblong, abruptly narrowing posteriorly; pubescence sparse, scattered small spots of fine white setae laterally; striae fine, scarcely distinct; intervals with fine transverse lines; species appearing smooth. Black. Length: 10–13 mm clavipes Bonsdorff
dubius (Ström)

10. Elytra almost glabrous. Rostrum short, dorsally flat, densely punctate, punctures increasing in coarseness and density toward apex (fig. 9, 25). Elytra and prothorax finely punctate, each puncture with minute silvery setae. Black. Length: 6–7 mm arcticus (O. Fabricius)
   — Elytra with fine erect hairs in serial rows on all intervals 11

11. Reddish, curled hairs in double rows on each elytral interval. Prothorax with dense, round tubercles, each tubercle with reddish, curled hair. Rostrum coarsely punctured, with deep longitudinal furrow at base; slightly raised, transverse ridge between antennal insertions; coalescent punctures forming lateral furrow above scrobe from antennal insertions to eye; coarsely punctured from antennal insertions to apex and depressed on each side of 2–3 short median carinae (fig. 10, 26). Reddish to piceous black. Length: 6–8 mm rugosostriatus (Goeze)
   — Whitish, stiff erect hairs in single row on each elytral interval. Prothorax

—
with dense low tubercles medially, becoming coarser and rough laterally, each tubercle with yellowish hair. Rostrum without median furrow; with wide shiny, smooth diagonal carina between antennal insertions; glabrous and almost impunctate from antennal insertions to apex. Reddish brown. (fig. 11, 27). Length: 4–6 mm ... ligneus (Olivier)

12. Femora 1 and 3, sometimes femur 2, with simple tooth .......... 13

— Femora toothed, tooth on femur 1 bifid or notched, femora 2 and 3 with simple, rarely bifid, tooth ........................................... 14

13. Elytra densely covered with tannish, submetallic, small round scales, irregular patches of lighter scales scattered over entire surface; each interval with row of small shiny tubercles, each tubercle with semierect golden seta; each stria puncture covered with round scale. Prothorax coarsely, densely tuberculate, tubercles becoming smaller laterally, scales as on elytra, very dense laterally. Rostrum densely scaly, with fine setae from base to smooth transverse raised area between antennal insertions; rugosely punctured from insertions to apex; laterally carinate with single line of long yellow hairs (fig. 12, 28). Black. Length: 6–7 mm .................. singularis (Linnaeus)

— Elytra with scattered patches of small golden, metallic, elongate scales and generally distributed, curved, yellow hairs; puncto-tuberculate; intervals convex, about as wide as striae, each with irregular row of low, shiny tubercles; striae deep, striae punctures separated by low shiny tubercle. Prothorax coarsely, densely tuberculate, each tubercle with curved yellow hair; sometimes with thin median line of yellowish-green scales in apical ½. Rostrum with wide, deep, longitudinal furrow; laterally carinate from base to antennal insertions; with deep furrow each side of raised emarginated apex (fig. 13, 29). Black, legs sometimes reddish. Length: 8–10 mm .................................. sulcatus (Fabricius)

— Elytra with fine curled setae serially arranged on intervals; intervals wide with fine granules; striae narrow, each puncture with fine short seta. Prothorax with low tubercles, each tubercle with deep puncture; with narrow, shallow, median furrow or with punctures coalescing to form short rugae. Rostrum without denuded apex, punctures strigose, coalescing to form a number of short longitudinal ridges from head to apex (fig. 14, 30). Black. Length: 4–6 mm .................. rugifrons (Gyllenhal)

14. Femur 1 with bifid tooth (fig. 35). Elytra with sparse, fine yellowish setae. Elytral intervals wide, transversely rugose; elytral striae shallow on disc, deeper laterally. Prothorax with large lateral tubercles and several elongate, smooth median ridges separating deep grooves. Rostrum flat, dull, coarsely, rugosely punctured, punctures coalescing to form short ridges, ridges extending backward and around deep frontal fovea to head, terminating a short distance behind eyes (fig. 15, 31). Black. Length: 5–6 mm .................................. ovatus (Linnaeus)

— Femur 1 with tooth notched at apex (fig. 36). Elytra with dense, yellowish setae. Elytral intervals narrow; elytral striae well developed, punctures large, deep. Prothorax with small acute, lateral tubercles and 1 smooth, uninterrupted ridge. Rostrum shiny, with shallow furrow and numerous elongate ridges from head to apex (fig. 16, 32). Brownish black. Length: 4–5 mm .................. desertus Rosenhauer
Hosts: Feeding habits of otiorhinchine weevils are diverse. Larvae feed exclusively underground; and some species, such as ligustici, which feeds only on alfalfa, are very host specific. Larvae of other species have a broader range; sulcatus, for example, has been recorded from more than 100 plant species. Adults of all species generally feed on a wider range of plants than the larvae and may feed on foliage, buds, and young shoots.

Table 1. Important European (E) and North American (NA) host plants of the three most common species of Otiorhynchus in North America.

<table>
<thead>
<tr>
<th>HOST</th>
<th>ovatus</th>
<th>rugosostriatus</th>
<th>sulcatus</th>
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<tbody>
<tr>
<td>Acer sp. (maple)</td>
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<td>Adiantum sp. (maidenhair)</td>
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<td>Borago sp. (borage)</td>
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<td>Celastrus sp. (bittersweet)</td>
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<td>Clematis sp. (clematis)</td>
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<td>Cordyline sp. (dracaena)</td>
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<td>Crataegus spp. (hawthorn)</td>
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<td>Cyclamen spp. (cyclamen)</td>
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<td>Daucus sp. (carrot)</td>
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<td>Fragaria spp. (strawberry)</td>
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<td>Humulus sp. (hops)</td>
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<td>Ilex spp. (holly)</td>
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<td>Juniperus spp. (juniper)</td>
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<td>Liguustrum spp. (privet)</td>
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<td>Medicago sativa (alfalfa)</td>
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<td>Mentha sp. (mint)</td>
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<td>Mirabilis sp. (four o'clock)</td>
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<td>Phaseolus sp. (bean)</td>
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<td>Picea sp. (spruce)</td>
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<td>Pinus sp. (pine)</td>
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<td>Polianthes tuberosa (tuberose)</td>
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<td>Primula obconica (top primrose)</td>
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<td>Prunus sp. (peach)</td>
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<td>Rhododendron sp. (rhododendron)</td>
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<td>Rosa spp. (rose)</td>
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<td>Rubus spp. (raspberry)</td>
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<td>Solanum sp. (nightshade)</td>
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<td>Solanum tuberosum (potato)</td>
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<td>Spiraea sp. (spirea)</td>
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<td>Taxus spp. (yew)</td>
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<td>Thuja spp. (arborvitae)</td>
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<td>Trifolium pratense (red clover)</td>
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<td>Tsuga sp. (hemlock)</td>
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<td>Vaccinium sp. (blueberry)</td>
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<tr>
<td>Vitis sp. (grape)</td>
<td>NA</td>
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</table>
Table 2. Some important European (E, e) and North American (NA) host plants of the less abundant species of *Otiornynchus* in North America. Uppercase letters indicate the host was recorded more than once for each species; lowercase letters are used when only one record was found for that species. * species found on moss in subalpine forests.

<table>
<thead>
<tr>
<th>HOST</th>
<th>ligustici</th>
<th>cricetulus</th>
<th>porcellus</th>
<th>scaber</th>
<th>raucus</th>
<th>dubius</th>
<th>meridionalis</th>
<th>elaeipes</th>
<th>arcticus</th>
<th>lignatus</th>
<th>singularis</th>
<th>rugifrons</th>
<th>descerta</th>
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<td><em>Amygdalus persica</em> (peach)</td>
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<td>(maritime wormwood)</td>
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<td><em>Chrysanthemum</em> sp.</td>
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<td><em>Cynara scolymus</em> (globe artichoke)</td>
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<td><em>Ilex</em> (holly)</td>
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<tr>
<td>HOST</td>
<td>ligustici</td>
<td>cebriicollis</td>
<td>porcatus</td>
<td>seaber</td>
<td>rauces</td>
<td>dubus</td>
<td>meridionalis</td>
<td>clavipes</td>
<td>arcticus</td>
<td>ligustis</td>
<td>singularis</td>
<td>rugifrons</td>
<td>desertis</td>
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<td><em>Pinus</em> spp. (pine)</td>
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<td><em>Plantago</em> sp. (plantain)</td>
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<td><em>Platanus orientalis</em> (oriental plane tree)</td>
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<td><em>Primula</em> sp. (primrose)</td>
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<td><em>Pyracantha</em> sp. (firethorn)</td>
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<td><em>Pyrus communis</em> (pear)</td>
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<td><em>Quercus</em> spp. (oak)</td>
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<td><em>Reseda luteola</em> (weld mignonette)</td>
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<td><em>Rheum</em> spp. (rhubarb)</td>
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<td><em>Rosa</em> spp. (rose)</td>
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<td><em>Rubus</em> spp. (raspberry)</td>
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<td><em>Rumex</em> spp. (dock)</td>
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<td><em>Saxifraga</em> spp. (saxifrage)</td>
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<td><em>Scorzonera humilis</em> (slime leaf wallrocket)</td>
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<td><em>Syringa</em> spp. (lilac)</td>
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<td><em>Trifolium</em> spp. (clover)</td>
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<td><em>Viburnum</em> sp. (viburnum)</td>
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<td><em>Vitis</em> spp. (grape)</td>
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Tables 1 and 2 are composed of host plants recorded for a particular species of *Otiorhynchus*. A distinction is made in Table 2 between a single record for a host and multiple records. The list is by no means inclusive.

*Otiorhynchus ligustici* (Linnaeus)  
fig. 1, 17, 39

This widely distributed Palaearctic species is recorded from England and Scotland, through northern and central Europe to Siberia, and south to Italy. It feeds on many plants but seems partial to and is a serious pest of alfalfa. *Otiorhynchus ligustici* was first recorded in North America from specimens taken on recently set raspberry plants near Oswego, New York (Herrick, 1933). The species was found in a few townships in Oswego and Jefferson counties, New York, in 1936 (Palm, 1936:960) and collected in Oswego by F. W. Poos in 1950. The species now extends throughout western Jefferson Co., along the lake in Oswego Co., the northern tip of Cayuga Co., an isolated area of Wayne Co., near Butler, and on several islands in the St. Lawrence River, including one Canadian island, probably Wolfe Island (G. G. Gyrisco, 1976, personal communication). A single specimen from the Wickham collection in the U. S. National Musuem, is labeled Oswego, N. Y., May 4, 1896; this may be evidence that the species had been in New York for 37 years or more before it increased sufficiently to be noticed. A detailed account of the species is given in Balachowsky (1963:896) and Lincoln and Palm (1941).

Distribution (Fig. 39): Canada: Wolfe Island. United States: New York.

*Otiorhynchus cribricollis* Gyllenhal  
fig. 2, 18, 37

This species occurs in southern Europe and the Mediterranean region and is widely distributed in all of North Africa. The host plant for the larva is wormwood, *Artemisia gallica* Willd., but the adult may feed on the foliage of almond, peach, olive, and citrus. The species is also established in Australia where in some districts it causes more damage to apples than all other insect pests combined (Tillyard, 1926:242). Andrewartha (1933:373) gave an account of the life history, habits, food plants, and parthenogenesis of *cribriocollis* in Australia. Zimmerman (1962:189) reported the larvae feeding on the roots of great burdock, *Arctium lappa* L., near Kamuela on the island of Hawaii. Davis (1966) recorded it established on the Island of Maui; adults of *Cribricollis* caused economic damage to commercial plantings of chysanthemum in Kula, Hawaii.

In North America, *cribriocollis* apparently was first found in June 1928 at Montebello, Los Angeles County, California (Van Dyke, 1929). The species now also occurs in Contra Costa, Yuba, Sacramento, San
Joaquin, and Santa Clara counties, California. Lange and McCalley (1962) reported economic damage to artichokes in California. The species was found in Midland, Texas, in 1966; on roots of honeysuckle, in Tucson, Arizona, 1950; on privet hedge, in Albuquerque, New Mexico, 1974, on rose; and in Carlsbad, New Mexico, 1975, on apple foliage.

Distribution (fig. 37): United States: Arizona, California, Nevada, New Mexico, Texas.

Otiorhynchus porcatus (Herbst)

According to Lona (1936:70), the Palaearctic distribution of porcatus is "Middle Europe." Kevan (1943:207; 1944:173) reported that the species is found in Scotland and gave notes on the habitat; it is associated with London pride, Saxifraga umbrosa L., and other border plants of the garden. Specimens were usually found on the soil under the leaves of London pride, feeding as larvae on the roots of the plant or similar plants and as adults on the leaves. In Norway, where it has been known as a pest since 1935, Fjelldalen (1963:144) describes injury to Primula sp. grown in greenhouses; the larvae were found feeding on rootlets and bark of larger roots. The symptoms of attack and damage resemble that of sulcatus. Live specimens from England, Germany, and Austria have been intercepted several times at eastern United States ports.

Distribution (fig. 40): Canada: Newfoundland, Quebec.

Otiorhynchus scaber (Linnaeus)

This species occurs in central and northern Europe. Kleine (1910:50) reported adults feeding on 1–4 year old plantings of norway spruce, Picea abies (= excelsa) L., and the leaves of silver fir, Abies alba Mill. In central Europe scaber is an important forest pest, feeding on foliage and bark of fir, pine, oak, and larch.

In North America scaber is known only from Nova Scotia (Lindroth, 1957:62).

Distribution (fig. 39): Canada: Nova Scotia.

Otiorhynchus raucus (Fabricius)

This species is widely distributed throughout Europe, less so in the Mediterranean region. Balachowsky (1963:884) and Hoffmann (1923:233; 1950:92) reported the species as a serious pest of cultivated rhubarb and garden vegetables; the larvae eat the young shoots. Adults feed on foliage, young shoots of apple, pear, cherry and the petioles of olive.
Fig. 1–8. Otiorhynchus spp., dorsal view of rostrum. 1, ligustici. 2, cribicollis. 3, porcatus. 4, scaber. 5, raucus. 6, dubius. 7, meridionalis. 8, clavipes.
Fig. 9–16. Otiorhynchus spp., dorsal view of rostrum. 9, arcticus. 10, rugosostriatus. 11, ligneus. 12, singularis. 13, sulcatus. 14, rugifrons. 15, ovatus. 16, desertus.
Hicks (1947) reported the species new to North America and established in Ontario, Canada. The specimens were found in Fonthill Nurseries, Fonthill, Ontario in 1936.

Distribution (fig. 39): Canada: Ontario.

Otiorhynchus dubius (Ström)
*(nodosus of O. Fabricius, nodosus Müller of authors)*

This species occurs in the alpine regions of middle Europe, in northern Europe, British Isles, Iceland, and Greenland. In Greenland it is found only in the far south and along the west coast (Henriksen, 1939:46).

The adult feeds on the green parts of many different dicotyledonous plants, and the larva is a root feeder (Larsson and Gija, 1959:190). In Iceland, *dubius* has been observed eating the leaves of sorrel, *Rumex acetosa* L., *R. domesticus* (Platt); dryad, *Dryas octopetala* L.; saxifrage, *Saxifraga hirculus* L.; and the blossoms of white clover, *Trifolium repens* L., (Lindroth, 1931:231); Holdhaus and Lindroth, 1939:215). According to Hamilton (1889:108) this species was found in the nests of *Formica rufa* L., at Kirjola, [Finland].

Distribution (fig. 42): Greenland.

Otiorhynchus meridionalis Gyllenhal

According to Balachowsky (1963:884) this species is widely distributed in the Mediterranean region and lives principally on Oleaceae: *Olea, Ligustrum, Syringa, Forsythia*, and * Jasminum*. Éssig (1933:400, 405) listed *meridionalis* on citrus and olives in Spain and Algeria. Keifer (1931) reported the first discovery of *meridionalis* in North America at San Jose, California, on California privet, *Ligustrum ovalifolium* Hassk.


Otiorhynchus clavipes Bonsdorff

This species is common in western Europe but does not extend to the Mediterranean region.

*Otiorhynchus clavipes* is polyphagous and in the larval stage is especially destructive to numerous nursery plants. It is a serious pest of strawberries in sections of England (Ibbotson and Edwards, 1954). The larvae eat the roots of lilac, *Syringa*; raspberry, *Rubus*; strawberry, *Fragaria*; smooth sumac, *Rhus glabra* L.; European cranberry bush, *Viburnum opulus* L.; bigsting nettle, *Urtica dioica* L.; *Weigelia*; curly

The only known North American record is from one specimen in the USNM labeled “Newport County, Rhode Island, July 16, 1942.” Although the fifth visible abdominal sternum is missing, the specimen is easily determined as a female of *clavipes*.

Distribution (fig. 40): United States: Rhode Island.

*Otiorhynchus arcticus* (O. Fabricius)

*Otiorhynchus arcticus* was described from Greenland and also occurs in north and central Europe. The species was recorded by Fjelldalen (1963:143) as a pest of strawberry in Norway and in 1959 was responsible for heavy losses to strawberry plants in northern Norway. The life cycle is very similar to that of *ovatus*; feeding symptoms and damage are the same. Poppius (1910:420) reported larvae of *arcticus* from roots of common statice or thrift, *Armeria vulgaris* Willd., and Kleine (1910:51) recorded the species on the leaves of rhubarb, *Rheum undulatum* L. The species has been intercepted at New York with sod roots from Scotland.

Distribution (fig. 42): Greenland.

*Otiorhynchus rugosostriatus* (Goeze)

This species is widely distributed in the western part of the Palaearctic region. The adult is polyphagous; Balachowsky and Mesnil (1935:473) said it is injurious to cyclamen plants in France and calls it “L’otiorhynque des cyclamens.” *Otiorhynchus rugosostriatus* is established in Australia where Tillyard (1926:242) reported it as injurious to fruit trees. It might also be established in South America, for there are three specimens evidently from Santiago, Chile, in the United States National Museum and, according to L. L. Buchanan’s note in the tray with the specimens, there is a specimen from Juan Fernandez Is., Chile, in the American Museum of Natural History collection.

As far as is known, *rugosostriatus* was first reported from North America by Horn (1876:61) under the name “rugifrons Gyll.” from the “Middle States.” This geographical term today might be interpreted as the middle West; but in Horn’s time it doubtlessly still retained its original meaning of Middle Atlantic States, i.e., Delaware, New Jersey, New York, Pennsylvania, and sometimes Maryland, an area in which several foreign weevils have first been detected in America.
In North America, it is injurious to strawberry in California, Colorado, Oregon, Washington, and British Columbia (Wilcox et al., 1934: 63). These authors suggested the name “rough strawberry root-weevil.”


_Otiorhynchus ligneus_ (Olivier)

*fig. 11, 27, 40*

This species is widely distributed in middle and northern Europe. There it feeds on a number of plants including: slimleaf wallrocket, *Diplotaxis tenuifolia* D. C.; weld mignonette, *Reseda luteola* L.; and bohemian serpentroot, *Scorzonera humilis* L. (Hoffmann, 1950:100).

In North America it is evidently very abundant in the Canadian Maritime Provinces; according to Brown (1940:76) it was collected at St. Stephens, New Brunswick, in 1917, Economy, Nova Scotia, in 1927, and Yarmouth, Nova Scotia, in 1935 and 1936. The specimens from St. Stephens are not now in the Canadian National Collection. Blatchley (1928:240) reported _ligneus_ from Machias, Maine, where it occurred in numbers, crawling in the rooms of a farmhouse. The only North American host record is on a specimen in the USNM; it was intercepted from Nova Scotia “alive with trailing arbutus.”


_Otiorhynchus singularis_ (Linnaeus)

*fig. 12, 28, 37*


The first North American report of _singularis_ (as the synonym, _picipes_ Fab.) was made in 1872 from Essex, Massachusetts (Brown, 1940:76). Brown also recorded the species from several places in New Brunswick, Nova Scotia, Ontario, Quebec, and Victoria, British Columbia. From labels on specimens in the United States National Museum, _singularis_ was found on white pine blister cankers, *Cronartium ribicola* Fischer and on laurestinus, *Viburnum tinus* L.
Fig. 26–32. *Otiørhyńchus* spp., lateral view of rostrum. 26, rugosostrīatus. 27, ligneus. 28, singularis. 29, sulcatus. 30, rugifrons. 31, ovatus. 32, desertus. Fig. 33–34. *Otiørhyńchus* spp., protibia. 33, ligustici and crībricollis. 34, all other species. Fig. 35–36. *Otiørhyńchus* spp., profemur. 35, ovatus. 36, desertus.
Fig. 37–38. Otiorhynchus spp., distribution. 37, singularis, meridionalis, cribicollis. 38, sulcatus.


Otiorhynchus sulcatus (Fabricius)
fig. 13, 29, 38

In the Palaeartic this species is widely distributed over northern and middle Europe as far south as France and Italy. It is also recorded
from Australia, New Zealand and Tasmania (Tillyard, 1926:242). In Europe, this species is most widely known for its economic damage to grapevines.

Harris (1835:569) recorded "Curculio (Otiorhynchus Germ.) apiculatus," from Massachusetts, and evidence presented by Hagen (1890) indicates that Harris' specimen was collected in 1831. Schoenherr (1843:371) listed apiculatus as a Say manuscript name and placed it as a synonym of sulcatus (F.). Thus sulcatus has apparently been present in this country about as long as ovatus, and it is possible that they arrived about the same time. The overall American ranges of the two are quite similar, but ovatus has seemingly spread farther and more rapidly; the area occupied by it being greater, more continuous, and extending farther south. The distribution of sulcatus is less extensive and much more "spotty."

The more or less indiscriminate preference of the black vine weevil is shown by the list of 77 host plants given by Smith (1932:4). The USDA, Plant Pest Survey files contain approximately 70 additional hosts. The literature on the economic importance of this species in the United States frequently includes greenhouse, nursery, and other horticultural plants. The larvae feed on roots and adults on foliage. Wilcox et al. (1934:73-76) mentioned several instances of damage to strawberry plants, though they considered it as probably the least important of the root weevils attacking strawberries in Oregon. The species has increased rapidly in numbers, and Cram (1958) reported that in the Pacific Northwest, sulcatus is probably more important than ovatus, the strawberry root weevil.


Otiorhynchus rugifrons (Gyllenhal)
fig. 14, 30, 40

This species, widely distributed in northern and middle Europe, is a pest of alpine saxifrage, Saxifraga spp., in Great Britain (Essig, 1933).

Otiorhynchus rugifrons was first recorded in North America in 1884 at Sydney, Nova Scotia (Harrington, 1891:22), and, according to Brown (1940:76) Harrington took it at the same place in 1890 and 1894.

In Harris' (1833) original edition of the list of species apparently had not yet been identified, because what presumably is apiculatus appeared on page 577 as "Curculio (Otiorhynchus), one species much like rugosus."
Buchanan (1927) noted the confusion of *rugifrons* with *rugosostriatus* in the North American literature and wrote "it is safe to say that practically all the American records for *rugifrons* excepting the Nova Scotian one by Harrington properly refer to *rugosostriatus*.

Distribution (fig. 40): Canada: Newfoundland, Nova Scotia.

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In the Palaearctic this species is well known and widely distributed and damages strawberry, raspberry, and beets. In North America, the species is known as the strawberry root weevil, because it frequently causes economic damage to strawberries, but it is a general feeder and occasionally becomes a pest of conifer seedlings in the Pacific Northwest (Wilcox et al., 1934).

Because of its early introduction and its economic importance, *ovatus* has an extensive North American literature. Wickham (1894) reported *ovatus* from Massachusetts in 1852; by 1882 it was a strawberry pest in southern Michigan. It was collected at Iowa City, Iowa, at least as early as 1886, in Wyoming in 1893, and in New Mexico in 1894. In the USNM collection, there are specimens collected on strawberry at Montavilla, Oregon, in 1900.

A peculiarity common to *ovatus*, *rugosostriatus*, *ligneus* and singu-
laris is the habit of entering houses and other buildings in large numbers during the summer. We have seen no references to this habit in European literature.

Distribution: In North America ovatus is the most widely distributed of all the species of Otiorhynchus. It extends across the continent in a broad band that includes all the provinces of Canada and the northern half of the United States. The southern limit, as shown by specimens examined, is the Welder Wildlife Refuge, Sinton, Texas. Specimens have been examined or records seen from all the United States except Georgia, Alabama, Arizona, Arkansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, and Tennessee.

Otiorhynchus desertus Rosenhauer
fig. 16, 32, 36, 39

This species is found in the Palaearctic region in northwestern and central Europe, especially in the Alpine and Pyrenees region. The adults have been found in the mosses of subalpine forests.

In North America desertus is known only from Newfoundland (Lindroth, 1957:62). A single specimen was found in 1949 by E. Palmen and Lindroth at Cape Broyle, in southeastern Newfoundland. This specimen is in the Canadian National Collection.

Distribution (fig. 39): Canada: Newfoundland.

We wish to express our gratitude to Dr. William J. Brown, Agriculture Canada, Biosystematics Research Institute, Research Branch, Ottawa, Canada (now retired) for his assistance in some of the initial work on the distribution of the Canadian species, and to Donald E. Bright of the same Institute for arranging the loan of the material in the Canadian National Collection. Theodore J. Spilman, USDA, Systematic Entomology Laboratory, Washington, D. C., Thomas J. Henry, Karl Valley and A. G. Wheeler, Jr., Pennsylvania Dept. of Agriculture, Harrisburg, reviewed and improved the manuscript. We extend special thanks to the staff of the Cooperative Plant Pest Report, USDA, Hyattsville, Maryland, who so generously printed-out from microfiche all collection and host records for each species. The figures, maps, and tables were prepared by Finley B. Negley.

References


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