

Ceutorhynchinae Weevils (Coleoptera, Curculionidae) Intercepted at the Narita Sub-station, Yokohama Plant Protection Station, Japan

Hiraku YOSHITAKE¹⁾, Masaaki GENKA²⁾ and Enzo COLONNELLI³⁾

¹⁾Institute for Agro-Environmental Sciences, NARO, 3–1–3 Kannondai,
Tsukuba, Ibaraki 305–8604, Japan

²⁾Narita Sub-station, Yokohama Plant Protection Station, Ministry of Agriculture,
Forestry and Fisheries of Japan, 2159 Tennamino,
Komaino, Narita, Chiba 282–0021, Japan

³⁾via Giunchiglie, 56 I–00172 Roma

Abstract We provided a list of 224 specimens belonging to 53 ceutorhynchine species (Coleoptera, Curculionidae), which were intercepted from 1984 to 2016 at the Narita Sub-station, Yokohama Plant Protection Station, Japan. The specimens examined were found by import inspections of vegetables and cut flowers from Africa, Europe, East Asia, Oceania, and North America. The dominant group is Ceutorhynchini, which has been intercepted continuously on vegetables from Europe and cut flowers from Africa. Interceptions of Ceutorhynchini weevils on European vegetables consists mainly of four species, *Ceutorhynchus erysimi*, *C. obstructus*, *C. pallidactylus*, and *C. picitarsis*, all of which are well-known pests of crucifers, whereas the overwhelming majority of those intercepted on cut flowers from Africa are species of the genus *Isorhynchus* in a broad sense as currently understood, including many undescribed species. Further studies on European and African Ceutorhynchini are necessary to assess the risk to plant protection in Japan. In addition, we provided dorsal and lateral habitus images for each species.

Introduction

GENKA and YOSHITAKE (2014) studied 219 unidentified weevil interceptions of the Kobe Plant Protection Station, Hyôgo, Japan. They analyzed chronological changes of dominant taxonomic groups and provided a list of the examined specimens, suggesting that some curculionid subfamilies feeding mainly on living plants, such as the Entiminae and Curculioninae, will become important for Japanese plant quarantine in association with the growth in air cargo transportation of perishables.

Within the family Curculionidae, Ceutorhynchinae is one of the most speciose subfamilies and relatively easy to distinguish from curculionids of other subfamilies. This subfamily is distributed worldwide and presently consists of eleven tribes, more than 100 genera, and 1,300 described species (COLONNELLI, 2004). Ceutorhynchinae weevils occur in a wide variety of habitats including semi-aquatic and aquatic ones and are known to be associated with woody, herbaceous, and even submerged plants (KOCH, 1992; BÖHME, 2001). The majority of species are monophagous or oligophagous, and larvae feed usually internally or much less frequently externally on a specific organ (root, stem, leaf, bud, flower, seed, etc.) of living bodies of their respective hosts. Due to their broad host range at the subfamily level, Ceutorhynchinae contain many agricultural pests (JOURDHEUIL, 1963) and many species of the subfamily have often been found during plant inspections (GENKA & YOSHITAKE, 2014).

Narita International Airport (NRT, hereafter), which is located in Narita City, Chiba Prefecture, Honshu, is one of the largest airports in Japan. Annually, more than 1,800 kinds of plants are imported to Japan through NRT from over 160 countries in various regions of the world. The portion of import

inspections for plants at NRT reaches 54% of the air cargo and 30% of the ship and air cargo altogether. As a result, various insects of quarantine importance have been intercepted at NRT on many occasions.

Here we provide a list of the 53 Ceutorhynchinae species intercepted from 1984 to 2016 at the Narita Sub-station, Yokohama Plant Protection Station. All specimens were found during import plant inspections and identified in 2016 by ourselves. Scientific names follow COLONNELLI (2004, 2013). Any illegible label data is indicated by question marks.

Before going further, we thank Steve R. DAVIS (American Natural History Museum, New York) for English correction of the manuscript.

List

Family **Curculionidae** Subfamily **Ceutorhynchinae**

Tribe **Phytobiini**

1. *Rhinoncus australis* OKE, 1931

(Figs. 1 & 2)

Specimen examined. 1 ex., New Zealand to NRT, 24.X.2008, K. NOMURA, on chilli.

Notes. This Oceanian species is distributed in Australia and New Zealand, feeding on *Polygonum persicaria* (Polygonaceae) (COLONNELLI, 2004). The examined specimen found on *Capsicum annuum* (Solanaceae) might get mixed accidentally during harvest or packing.

Tribe **Amalini**

2. *Amalus scortillum* (HERBST, 1795)

(Figs. 3 & 4)

Specimens examined. 1 ex., Netherlands to NRT, 18.XI.1997, M. TAKADA, on fennel. 1 ex., USA to NRT, 5.XII.1984, K. WARAYA, on cut branches of *Abies* sp.

Notes. This species is distributed in Europe, the Middle East, Central Asia, Siberia, Northeast Asia, and North America, and is known to be associated with *Polygonum aviculare*, *Rumex obtusifolius*, and *R. acetosa* (Polygonaceae) (COLONNELLI, 2004). The specimen examined might get mixed accidentally during harvest or packing.

Tribe **Ceutorhynchini**

3. *Cardipennis sulcithorax* (HUSTACHE, 1916)

(Figs. 5 & 6)

Specimen examined. 1 ex., China to NRT, 8.V.2014, on shiso.

Notes. This species is known to occur in continental China, Japan, Korea, the south of the Russian Far East, and Taiwan, and the adults are commonly found on *Humulus scandens* (Cannabaceae) (YOSHITAKE & LEE, 2016). The examined specimen taken from *Perilla frutescens* var. *crispa* (Lamia-

ceae) might get mixed accidentally during harvest or packing.

4. *Ceutorhynchus albosuturalis* (ROELOFS, 1875)

(Figs. 7 & 8)

Specimens examined. China to NRT: 2 exs., 5.V.1998, N. SAITO, on flowering cabbage; 1 ex., 9.VI.2001, T. IWASHITA, on green choi sum; 1 ex., 9.VII.2001, ?, on green pak choi (data illegible in part); 1 ex., 8.V.2002, S. KOSAKA, on choi sum. 1 ex., South Korea to NRT, 13.IV.1999, K. SUZUKI, on mugwort.

Notes. *Ceutorhynchus albosuturalis* is widely distributed in continental China, Japan, Korea, the Kuril Isls., Sakhalin, and the south of the Russian Far East (YOSHITAKE *et al.*, 2004). This species is associated with various Brassicaceae plants, such as *Capsella bursa-pastoris*, *Raphanus sativus*, and *Brassica* spp. (MORIMOTO, 1957). The specimens examined were found on the Brassicaceae, *Brassica oleracea*, *B. rapa* var. *chinensis* and *B. rapa* var. *utilis*, all of which were imported from China. One of the examined specimens, which was captured on *Artemisia indica* var. *maximowiczii* (Asteraceae) from South Korea, might get mixed accidentally during harvest or packing.

5. *Ceutorhynchus contractus* (MARSHAM, 1802)

(Figs. 9 & 10)

Specimens examined. Italy to NRT: 1 ex., 2.VI.2005, IWANE, on savoy cabbage; 1 ex., 17.IV.2009, M. MASUMOTO, on turnip.

Notes. This species is widely distributed in the Eurasian continent and is associated with several members of Brassicaceae, Resedaceae, Capparidaceae, *Papaver* (Papaveraceae), *Tropaeolum* (Tropaeolaceae), and *Limnanthes* (Limnanthaceae) (COLONNELLI, 2004). The specimens examined were taken from *Brassica oleracea* and *B. rapa* subsp. *rapa* (Brassicaceae).

6. *Ceutorhynchus erysimi* (FABRICIUS, 1787)

(Figs. 11 & 12)

Specimens examined. 1 ex., Belgium to NRT, 25.XI.1993, I. TOMITA, on leek. 1 ex., Netherlands to NRT, 17.IX.1984, K. WARAYA, on Chinese cabbage.

Notes. This Holarctic species is associated with various Brassicaceae plants, *Capsella bursa-pastoris* in particular (COLONNELLI, 2004). The two specimens examined were captured on *Brassica rapa* var. *pekinensis* (Brassicaceae) and *Allium ampeloprasum* var. *porrum* (Amaryllidaceae), respectively. The latter might get mixed accidentally during harvest or packing.

7. *Ceutorhynchus ibukianus* HUSTACHE, 1916

(Figs. 13 & 14)

Specimens examined. South Korea to NRT, on wild sesame: 1 ex., 9.XI.1994, M. SAI; 1 ex., 12.III.1997, K. WARAYA.

Notes. This species is known to occur in Japan and Korea (YOSHITAKE, 2004) and feeds on *Rorippa indica* (Brassicaceae) (MORIMOTO, 1957). The examined specimens captured on *Perilla frutescens* var. *frutescens* (Lamiaceae) from South Korea might get mixed accidentally during harvest or packing.

8. *Ceutorhynchus obstrictus* (MARSHAM, 1802)

(Figs. 15 & 16)

Specimens examined. 1 ex., Belgium to NRT, 5.VII.2014, T. FUJIWARA, on watercress. France to NRT, on savoy cabbage: 1 ex., 5.VII.2000, M. KOJIMA; 1 ex., 30.VII.2016, N. SAITO. USA to NRT: 1 ex., 16.V.1996, T. YOKOYAMA, on mizuna; 1 ex., 29.VIII.2010, R. KOUNO, on broccoli.

Notes. This is a well-known pest species as the cabbage seedpod weevil, widely distributed in the western Palaearctic Region and feeding on several Brassicaceae plants (COLONNELLI, 2004). This species was introduced to North America from Europe in the 1930s and then became widespread in most of the temperate region of Canada and USA. In addition, this species was recorded from South Korea (HONG *et al.*, 2000, 2011). All specimens examined in this study were captured on Brassicaceae plants: *Nasturtium officinale* from Belgium and three cultivars of *Brassica oleracea* from France and USA.

9. *Ceutorhynchus pallidactylus* (MARSHAM, 1802)

(Figs. 17 & 18)

Specimens examined. 1 ex., Belgium to NRT, 9.IV.2011, T. MOMIYAMA, on savoy cabbage. Italy to NRT: 2 exs., 16.II.2001, Y. TAJIMA, on savoy cabbage; 1 ex., 21.II.2002, M. KOJIMA, on cauliflower; 1 ex., 20.XI.2008, T. HIRAMOTO, on kale; 1 ex., 17.IV.2009, M. MASUMOTO, on cauliflower; 2 exs., 25.XI.2010, Y. HOSHINO, on cauliflower; 1 ex., 29.XI.2010, Y. HOSHINO, on savoy cabbage; 1 ex., 6.XI.2014, H. SAKAI, on cauliflower; 1 ex., 24.XI.2016, H. SAKATA, on kale. 1 ex., Netherlands to NRT, 30.IV.2005, T. MATSUZAWA, on savoy cabbage.

Notes. This is a widely distributed species known from Africa, the Middle East, Europe, Central Asia, Thailand and USA, and is associated with several Brassicaceae and Resedaceae plants (COLONNELLI, 2004). The specimens examined were taken from four cultivars of *Brassica oleracea* (Brassicaceae).

10. *Ceutorhynchus picitarsis* (GYLLENHAL, 1837)

(Figs. 19 & 20)

Specimens examined. Italy to NRT: 1 ex., 12.I.2003, T. IWASHITA, on turnip; 1 ex., 19.I.2003, M. KOJIMA, on turnip; 1 ex., 22.I.2009, H. SUZUKI, on turnip; 1 ex., 18.XI.2010, Y. HOSHINO, on cauliflower; 1 ex., 28.XI.2013, T. TOKI, on turnip; 1 ex., 5.XI.2015, Y. OKADA, on turnip; 1 ex., 11.XII.2015, Y. NOTO, on turnip.

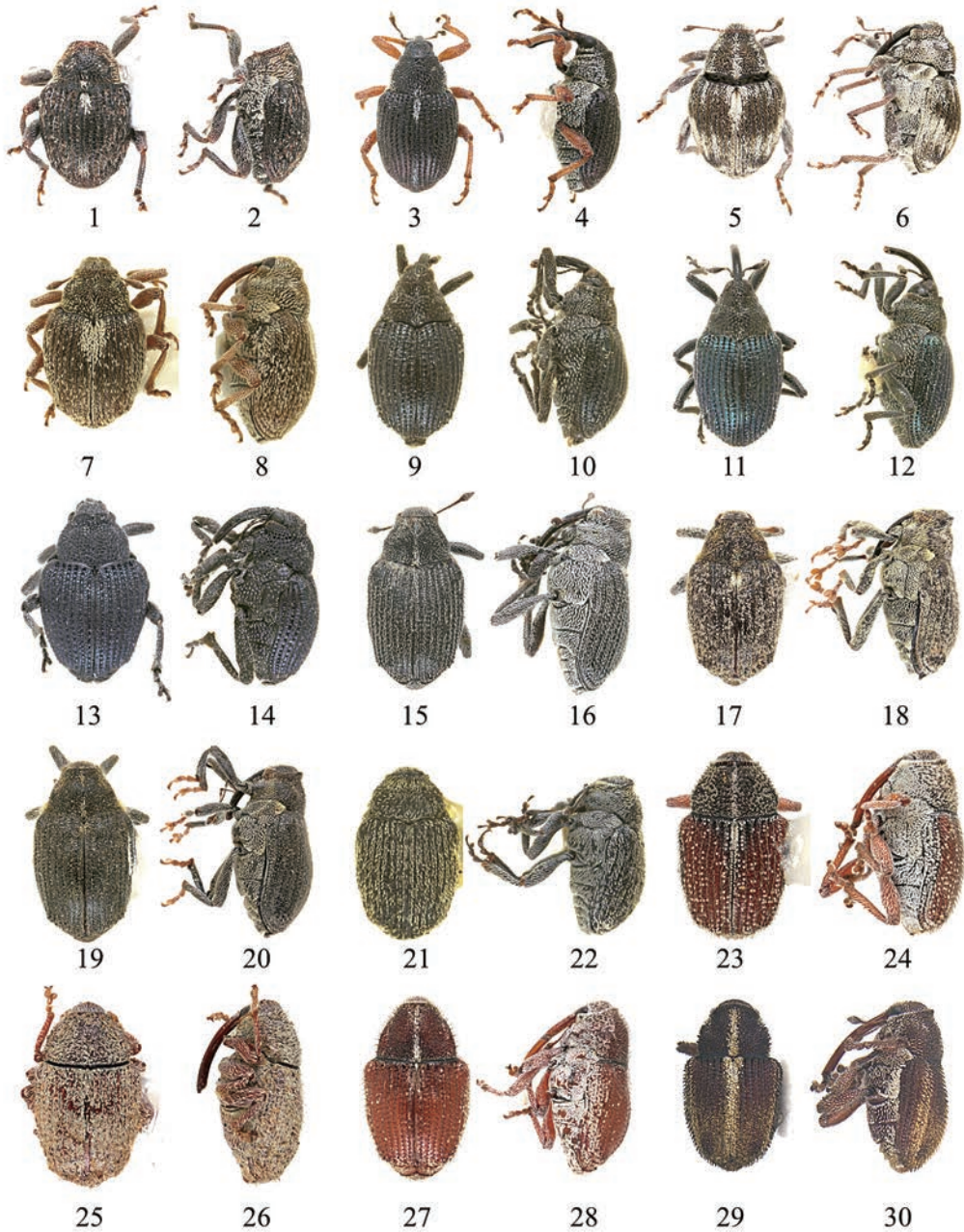
Notes. This species is widely distributed in the western Palaearctic Region and is associated with several Brassicaceae plants (COLONNELLI, 2004). The specimens examined were found from *Brassica rapa* subsp. *rapa* and a cultivar of *B. oleracea* (Brassicaceae).

11. *Ceutorhynchus pyrrhorhynchus* (MARSHAM, 1802)

(Figs. 21 & 22)

Specimen examined. 1 ex., Spain to NRT, 16.VI.2006, S. SEKIMOTO, on lettuce.

Notes. This Euro-Mediterranean species is known to be associated with *Sisymbrium officinale*, *S. loeselii*, and *S. irio* (Brassicaceae) (COLONNELLI, 2004). The specimen examined was found from *Lactuca sativa* (Asteraceae), suggesting that it was mixed accidentally during harvest or packing.



Figs. 1–30. Dorsal and lateral habitus of Ceutorhynchinae species intercepted at Narita International Airport from 1984 to 2016. — 1 & 2, *Rhinoncus australis* OKE from New Zealand; 3 & 4, *Amalus scoritillum* (HERBST) from Netherlands; 5 & 6, *Cardipennis sulcithorax* (HUSTACHE) from China; 7 & 8, *Ceutorhynchus albosuturalis* (ROELOFS) from China; 9 & 10, *Ceutorhynchus contractus* (MARSHAM) from Italy; 11 & 12, *Ceutorhynchus erysimi* (FABRICIUS) from Netherlands; 13 & 14, *Ceutorhynchus ibukianus* HUSTACHE from South Korea; 15 & 16, *Ceutorhynchus obstructus* (MARSHAM) from USA; 17 & 18, *Ceutorhynchus pallidactylus* (MARSHAM) from Italy; 19 & 20, *Ceutorhynchus picitarsis* (GYLLENHAL) from Italy; 21 & 22, *Ceutorhynchus pyrrhorhynchus* (MARSHAM) from Spain; 23 & 24, *Isorhynchus* sp. 1 from South Africa; 25 & 26, *Isorhynchus* sp. 2 from South Africa; 27 & 28, *Isorhynchus* sp. 3 from South Africa; 29 & 30, *Isorhynchus* sp. 4 from South Africa.

12. *Isorhynchus* sp. 1

(Figs. 23 & 24)

Specimens examined. South Africa to NRT: 2 exs., 14.X.1993, T. MATSUZAWA, on *Leucospermum* sp.; 9 exs., 26.X.1993, K. KITAGAWA, on *Leucospermum* sp.; 1 ex., 2.VIII.1994, N. YAMAGUCHI, on *Berzelia* sp.

Notes. The genus *Isorhynchus* contains many undescribed species usually associated with plants of the family Proteaceae (COLONNELLI, unpublished data). The specimens examined were captured on cut flowers of *Leucospermum* sp. (Proteaceae) and *Berzelia* sp. (Bruniaceae), indicating that this species has some relationship with these plants.

13. *Isorhynchus* sp. 2

(Figs. 25 & 26)

Specimens examined. South Africa to NRT: 2 exs., 22.VIII.1994, M. NAKAJIMA, on *Leucospermum* sp.; 1 ex., 22.VII.1991, N. YAMAGUCHI, on *Leucospermum* sp.; 6 exs., 9.I.199?, ????, on *Leucospermum* sp. (data illegible in part); 1 ex., 3.X.2003, Y. TOGASHI, on *Leucospermum* sp.

Note. All the specimens examined were captured on cut flowers of *Leucospermum* sp. (Proteaceae) imported from South Africa, a putative host plant of this species.

14. *Isorhynchus* sp. 3

(Figs. 27 & 28)

Specimen examined. 1 ex., South Africa to NRT, 14.VII.199?, T. INABA, on *Protea* sp. (data illegible in part).

Note. The specimen examined was captured on cut flowers of *Protea* sp. (Proteaceae) imported from South Africa.

15. *Isorhynchus* sp. 4

(Figs. 29 & 30)

Specimen examined. 1 ex., South Africa to NRT, 8.XI.2016 T. NISHI, from bouquet.

Note. The specimen examined was found from a bouquet imported from South Africa.

16. *Isorhynchus* sp. 5

(Figs. 31 & 32)

Specimens examined. South Africa to NRT, on *Brunia* sp.: 1 ex., 14.XII.2000, M. TAKADA; 1 ex., 25.XI.2002, T. YAMADA; 1 ex., 30.IX.2003, I. YOKOYAMA.

Note. All specimens examined were captured separately on cut flowers of *Brunia* sp. (Bruniaceae) imported from South Africa, a putative host plant of this species.

17. *Isorhynchus* sp. 6

(Figs. 33 & 34)

Specimens examined. South Africa to NRT, on *Berzelia* sp.: 1 ex., 13.XII.2015, R. TOKUDOME; 1

ex., 12.VI.2004, T. AMANO; 1 ex., 10.XI.2000, H. KON.

Note. All specimens examined were captured separately on cut flowers of *Berzelia* sp. (Bruniaceae) imported from South Africa, indicating that this species has some relationship with the plant.

18. *Isorhynchus* sp. 7

(Figs. 35 & 36)

Specimens examined. South Africa to NRT: 1 ex., 2.XII.2016, E. NARITA, on *Berzelia* sp.; 1 ex., 12.XII.2016, J. SUZUKI, on *Retzia* sp.

Note. The specimens examined were captured on cut flowers of *Berzelia* sp. (Bruniaceae) and *Retzia* sp. (Stilbaceae), both of which were imported from South Africa.

19. *Isorhynchus* sp. 8

(Figs. 37 & 38)

Specimens examined. South Africa to NRT: 2 exs., 6.XII.2000, T. FUJIWARA, on *Berzelia* sp.; 2 exs., 13.XII.1997, G. TAKAHASHI, on *Berzelia* sp.; 1 ex., 18.I.2014, H. SAKUMA, on *Berzelia* sp.; 1 ex., 5.II.1986, H. ISHIZAKI, on *Brunia* sp.; 2 exs., 31.III.2007, J. ICHIKAWA, on *Berzelia* sp.; 1 ex., 27.I.2003, T. KAWAI, on *Brunia* sp.; 1 ex., 16.XII.2002, Y. TOGASHI, on *Berzelia* sp.

Note. The specimens examined were captured on cut flowers of *Berzelia* sp. and *Brunia* sp. (Bruniaceae) imported from South Africa, indicating that this species has some relationship with these plants.

20. *Isorhynchus* sp. 9

(Figs. 39 & 40)

Specimens examined. South Africa to NRT: 1 ex., 2.VIII.1994, N. YAMAGUCHI, on *Berzelia* sp.; 1 ex., 4.XII.2015, W. MIYAZAKI, on *Berzelia* sp.; 1 ex., 16.V.2005, WATABE, on *Leucadendron* sp.; 1 ex., 31.V.2014, T. KOYAMA, on *Leucadendron* sp.

Note. The specimens examined were captured on cut flowers of *Berzelia* sp. (Bruniaceae) and *Leucadendron* sp. (Proteaceae), both of which were imported from South Africa, indicating that this species has some relationship with these plants.

21. *Isorhynchus* sp. 10

(Figs. 41 & 42)

Specimens examined. South Africa to NRT: 2 exs., 23.III.2002, K. TAKASAWA, on *Phylica* sp.; 1 ex., 29.VI.2002, H. HASHIMOTO, on *Phylica* sp.; 2 exs., 2.VI.2003, H. YANAGISAWA, on *Phylica* sp.; 1 ex., 8.III.2003, H. SAKATA, on *Phylica* sp.; 1 ex., 24.IV.2006, A. NEZU, on *Phylica* sp.; 1 ex., 29.IV.2006, H. YANAGISAWA, collected as larva from *Phylica* sp., emerged on 25.V.2006; 1 ex., 14.IX.2007, T. FUJIWARA, on *Phylica* sp.; 1 ex., 21.III.2008, H. NAKAGAWA, on *Berzelia* sp.; 1 ex., 30.X.2015, M. TAKEZAKI, from bouquet.

Notes. An adult was reared from a larva found in cut flowers of *Phylica* sp. (Rhamnaceae), indicating that this species is associated with the plant. In addition, adult weevils were found on the same plant on several occasions.

22. *Isorhynchus* sp. 11

(Figs. 43 & 44)

Specimens examined. South Africa to NRT: 1 ex., 26.X.1993, K. KITAGAWA, on *Leucospermum* sp.; 1 ex., 23.VI.2015, M. TOMIZAWA, on *Leucadendron* sp.

Note. The specimens examined were captured on cut flowers of *Leucospermum* sp. and *Leucadendron* sp. (Proteaceae) imported from South Africa.

23. *Isorhynchus* sp. 12

(Figs. 45 & 46)

Specimens examined. South Africa to NRT: 1 ex., 7.XII.2003, H. YANAGISAWA, on *Brunia* sp.; 1 ex., 17.XI.2001, H. KITAMURA, on *Leucadendron* sp.

Note. The specimens examined were collected from cut flowers of *Brunia* sp. (Bruniaceae) and *Leucadendron* sp. (Proteaceae) imported from South Africa.

24. *Isorhynchus* sp. 13

(Figs. 47 & 48)

Specimen examined. 1 ex., South Africa to NRT, 30.XI.2007, M. YAMAYA, on *Protea* sp.

Note. The specimen examined was captured on cut flowers of *Protea* sp. (Proteaceae) imported from South Africa.

25. *Isorhynchus* sp. 14

(Figs. 49 & 50)

Specimens examined. South Africa to NRT: 1 ex., 10.XI.2009, S. MUTOU, on *Leucadendron* sp.; 1 ex., 20.X.2008, S. MIYOSHI, on *Leucadendron* sp.

Note. The specimens examined were collected from cut flowers of *Leucadendron* sp. (Proteaceae) imported from South Africa.

26. *Isorhynchus* sp. 15

(Figs. 51 & 52)

Specimens examined. South Africa to NRT, on *Phyllica* sp.: 1 ex., 26.I.2015, S. KAWANO; 1 ex., 9.II.2015, K. ARAKAWA.

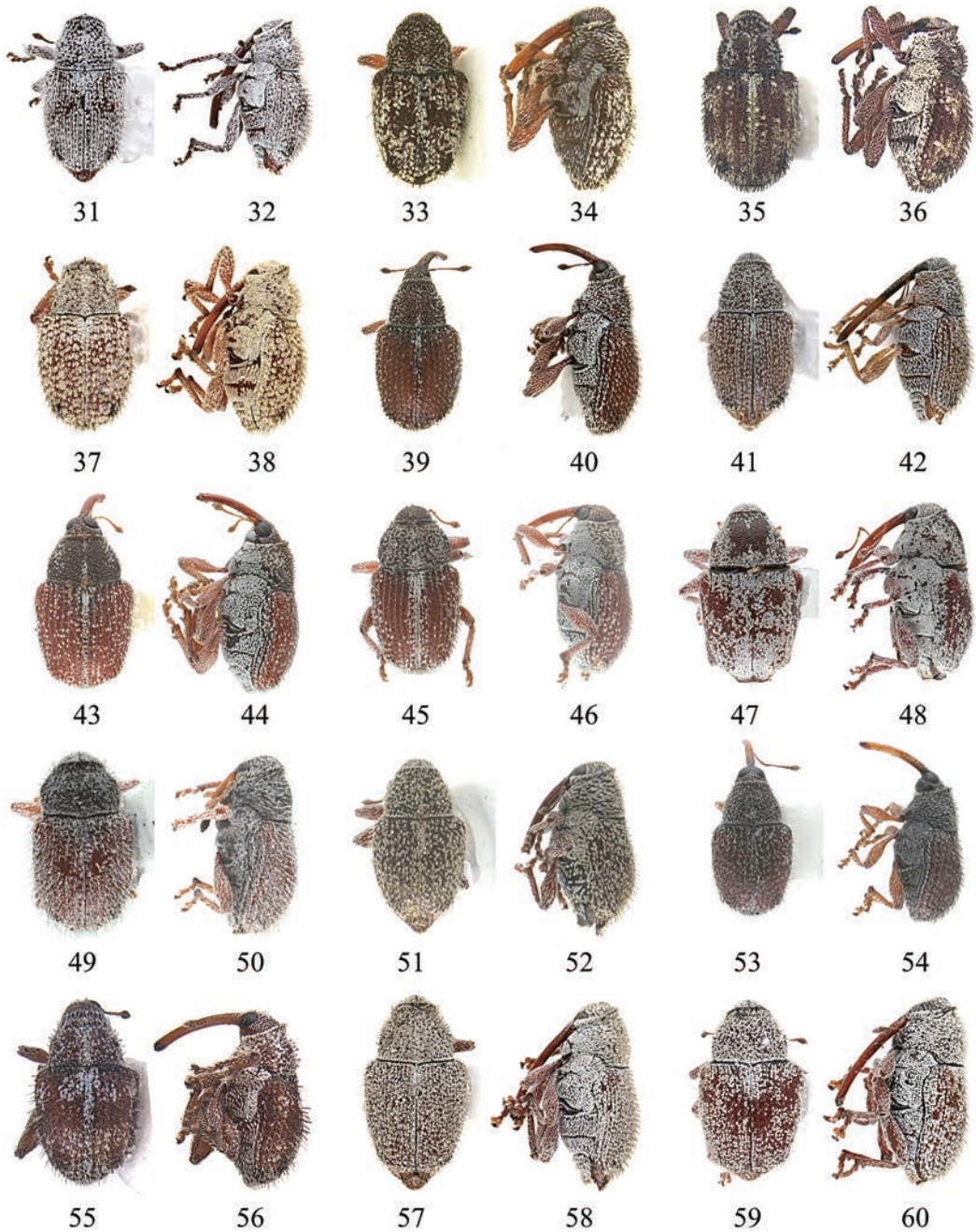
Note. The two specimens examined were captured on cut flowers of *Phyllica* sp. (Rhamnaceae) imported from South Africa.

27. *Isorhynchus* sp. 16

(Figs. 53 & 54)

Specimen examined. 1 ex., South Africa to NRT, 11.XII.1991, Y. YOSHIDA, on *Brunia laevis*.

Note. The specimen examined was collected from cut flowers of *Brunia laevis* (Bruniaceae) imported from South Africa.



Figs. 31–60. Dorsal and lateral habitus of South African *Isorhynchus* spp. intercepted at Narita International Airport from 1984 to 2016. — 31 & 32, *Isorhynchus* sp. 5; 33 & 34, *I.* sp. 6; 35 & 36, *I.* sp. 7; 37 & 38, *I.* sp. 8; 39 & 40, *I.* sp. 9; 41 & 42, *I.* sp. 10; 43 & 44, *I.* sp. 11; 45 & 46, *I.* sp. 12; 47 & 48, *I.* sp. 13; 49 & 50, *I.* sp. 14; 51 & 52, *I.* sp. 15; 53 & 54, *I.* sp. 16; 55 & 56, *I.* sp. 17; 57 & 58, *I.* sp. near *candidulus* (GYLLENHAL); 59 & 60, *I.* sp. near *pudicus* (SPARRMAN).

28. *Isorhynchus* sp. 17

(Figs. 55 & 56)

Specimen examined. 1 ex., South Africa to NRT, 12.XII.2016, J. SUZUKI, on *Brunia* sp.

Note. The specimen examined was collected from cut flowers of *Brunia* sp. (Bruniaceae) imported from South Africa.

29. *Isorhynchus* sp. near *candidulus* (GYLLENHAL, 1835)

(Figs. 57 & 58)

Specimen examined. 1 ex., South Africa to NRT, 25.V.2002, T. YAMADA, on *Paranomus* sp.

Note. The specimen examined was collected from cut flowers of *Paranomus* sp. (Proteaceae) imported from South Africa.

30. *Isorhynchus* sp. near *pudicus* (SPARRMAN, 1785)

(Figs. 59 & 60)

Specimens examined. 2 exs., South Africa to NRT, 15.VII.2000, G. TAKAHASHI, on *Paranomus* sp.

Note. The specimens examined were collected from cut flowers of *Paranomus* sp. (Proteaceae) imported from South Africa.

31. *Isorhynchus* (s. lat.) sp. 1

(Figs. 61 & 62)

Specimen examined. 1 ex., South Africa to NRT, 9.XI.2002, I. SAITO, on *Berzelia* sp.

Note. The specimen examined was captured on cut flowers of *Berzelia* sp. (Bruniaceae) imported from South Africa.

32. *Isorhynchus* (s. lat.) sp. 2

(Figs. 63 & 64)

Specimens examined. South Africa to NRT: 1 ex., 20.IV.2002, T. INOUE, on *Phyllica* sp.; 1 ex., 14.XI.2007, T. FUJIWARA, on *Phyllica* sp.; 1 ex., 14.V.2007, M. YAMAYA, on *Berzelia* sp.

Note. The specimens examined were captured on cut flowers of *Phyllica* sp. (Rhamnaceae) and *Berzelia* sp. (Bruniaceae) imported from South Africa.

33. *Isorhynchus* (s. lat.) sp. 3

(Figs. 65 & 66)

Specimens examined. South Africa to NRT, on *Nebelia* sp.: 1 ex., 16.VI.2003, Y. TOGASHI; 1 ex., 30.VI.2007, S. NAKAMURA; 1 ex., 7.VII.2007, T. IMAJYO; 1 ex., 28.VII.2007, M. FUJIWARA.

Note. Occasionally, this species has been found on cut flowers of *Nebelia* sp. (Bruniaceae) imported from South Africa, indicating its association with the plant.

34. *Isorhynchus* (s. lat.) sp. 4

(Figs. 67 & 68)

Specimens examined. South Africa to NRT: 1 ex., 31.VIII.2001, K. TAKASAWA, on *Brunia* sp.; 2 exs., 16.VII.2007, M. KAWASAKI, on *Phylica* sp.; 1 ex., 20.XI.2010, M. ASAI, on *Phaenocoma* sp.

Note. The specimens examined were captured on cut flowers of *Brunia* sp. (Bruniaceae), *Phaenocoma* sp. (Asteraceae) and *Phylica* sp. (Rhamnaceae) imported from South Africa.

35. *Isorhynchus* (s. lat.) sp. 5

(Figs. 69 & 70)

Specimens examined. South Africa to NRT, on *Berzelia* sp.: 1 ex., 10.VII.2004, ? (data illegible in part); 1 ex., 2.XI.2002, I. SAITO; 1 ex., 13.IX.2002, T. MATSUZAWA; 1 ex., 21.IX.2001, A. TAKANO; 1 ex., 30.XI.2008, S. SASAKI; 1 ex., 30.X.2008, R. KOUNO.

Note. All specimens examined were found on cut flowers of *Berzelia* sp. (Bruniaceae) imported from South Africa, indicating that this species is associated with the plant.

36. *Isorhynchus* (s. lat.) sp. 6

(Figs. 71 & 72)

Specimens examined. South Africa to NRT, on *Berzelia* sp.: 2 exs., 31.VIII.1991, H. KADOI; 1 ex., 31.VIII.2001, A. TAKANO; 2 exs., 29.IX.2001, A. TAKANO; 1 ex., 27.VII.2002, H. SAKAI; 1 ex., 21.VIII.2002, H. SAKAI; 1 ex., 24.VIII.2002, T. INOUE; 1 ex., 31.VIII.2002, T. INOUE; 3 exs., 8.IX.2002, Y. TOGASHI; 1 ex., 11.IX.2002, Y. TOGASHI; 1 ex., 13.IX.2002, T. ISHIZU; 1 ex., 18.IX.2002, T. INOUE; 3 exs., 26.IX.2002, Y. NAOE; 2 exs., 13.IX.2003, Y. TOGASHI; 1 ex., 13.IX.2003, T. ISHIZU; 2 exs., 14.IX.2003, H. YANAGISAWA; 2 exs., 28.VIII.2006, J. ICHIKAWA; 3 exs., 1.IX.2007, Y. SHIMONO; 2 exs., 26.VII.2008, N. IKEDA; 2 exs., 23.VIII.2008, N. YAMASAKI; 3 exs., 27.VIII.2008, T. HIRAMOTO; 1 ex., 13.IX.2008, K. TAKASAWA; 3 exs., 16.IX.2008, T. HIRAMOTO; 3 exs., 24.IX.2008, N. IKEDA; 1 ex., 2.VII.2011, M. YOSHIKAWA; 1 ex., 11.XI.2011, T. HIRAMOTO; 1 ex., 14.IX.2013, M. YOSHIKAWA; 1 ex., 9.IX.2016, M. ARIMOTO. South Africa to NRT, on *Brunia* sp.: 2 exs., 31.VIII.2001, K. TAKASAWA; 1 ex., 21.IX.2001, A. TAKANO. 1 ex., South Africa to NRT, 5.IX.2001, S. KIMURA, on *Leucadendron* sp. 1 ex., South Africa to NRT, 18.VIII.2006, H. NAKAGAWA, on *Cannomois* sp.

Notes. Most of the specimens examined were captured on cut flowers of *Berzelia* sp. (Bruniaceae) imported from South Africa, suggesting that this species is associated with the plant. There is one example that an adult was captured on cut flowers of *Cannomois* sp. (Restionaceae) also from South Africa, but it might get mixed with imported goods in the distribution process.

37. *Isorhynchus* (s. lat.) sp. 7

(Figs. 73 & 74)

Specimens examined. South Africa to NRT, on *Berzelia* sp.: 1 ex., 20.VII.2003, Y. TOGASHI; 1 ex., 6.IX.2003, T. IWASHITA; 1 ex., 28.VII.2006, R. IWAIZUMI; 1 ex., 25.VIII.2007, J. HISAI; 1 ex., 8.VI.2008, R. HIRAMA; 1 ex., 27.VIII.2008, T. HIRAMOTO; 1 ex., 30.VIII.2008, Y. HIGO; 1 ex., 4.X.2008, T. NEZU; 1 ex., 5.IX.2009, T. HIRAMOTO. 1 ex., South Africa to NRT, 30.VIII.2008, Y. HIGO, on *Brunia* sp. 1 ex., South Africa to NRT, 3.VII.2015, M. TAKEZAKI, on *Nebelia* sp.

Notes. Most of the specimens examined were captured on cut flowers of *Berzelia* sp. (Bruniaceae)

ae) imported from South Africa, suggesting that this species is associated with the plant. In addition, there is a specimen captured on cut flowers of *Nebelia* sp. (Bruniaceae) also from South Africa.

38. *Isorhynchus* (s. lat.) sp. 8

(Figs. 75 & 76)

Specimens examined. South Africa to NRT: 1 ex., 29.VI.2002, Y. TOGASHI, on *Berzelia* sp.; 1 ex., 12.XI.2009, T. HIRAMOTO, on *Berzelia* sp.; 1 ex., 14.XI.2014, K. ARAKAWA, on *Berzelia* sp.; 1 ex., 1.XII.2007, J. ICHIKAWA, on *Brunia* sp.; 1 ex., 1.XII.2003, K. ASO, on *Leucadendron* sp.; 2 exs., 10.IX.2003, I. MASUYAMA, on *Leucadendron* sp.; 1 ex., 14.XI.2007, T. SENGOU, on *Leucadendron* sp.

Note. The specimens examined were captured on cut flowers of *Berzelia* sp. (Bruniaceae), *Brunia* sp. (Bruniaceae), and *Leucadendron* sp. (Proteaceae) imported from South Africa.

39. *Isorhynchus* (s. lat.) sp. 9

(Figs. 77 & 78)

Specimens examined. South Africa to NRT: 1 ex., 8.IX.2001, H. KITAMURA, on *Nebelia* sp.; 1 ex., 4.X.2003, I. SAITO, on *Phaenocoma* sp.

Note. The two specimens of this species were captured on cut flowers of *Nebelia* sp. (Bruniaceae) and *Phaenocoma* sp. (Asteraceae) imported from South Africa.

40. *Isorhynchus* (s. lat.) sp. 10

(Figs. 79 & 80)

Specimen examined. 1 ex., South Africa to NRT, 25.IX.2010, K. USHIZAKA, on *Erica* sp.

Note. The specimen examined was captured on cut flowers of *Erica* sp. (Ericaceae) imported from South Africa.

41. *Isorhynchus* (s. lat.) sp. 11

(Figs. 81 & 82)

Specimen examined. 1 ex., South Africa to NRT, 10.X.2016, W. MIYAZAKI, on *Erica* sp.

Note. The specimen examined was captured on cut flowers of *Erica* sp. (Ericaceae) imported from South Africa.

42. *Isorhynchus* (s. lat.) sp. 12

(Figs. 83 & 84)

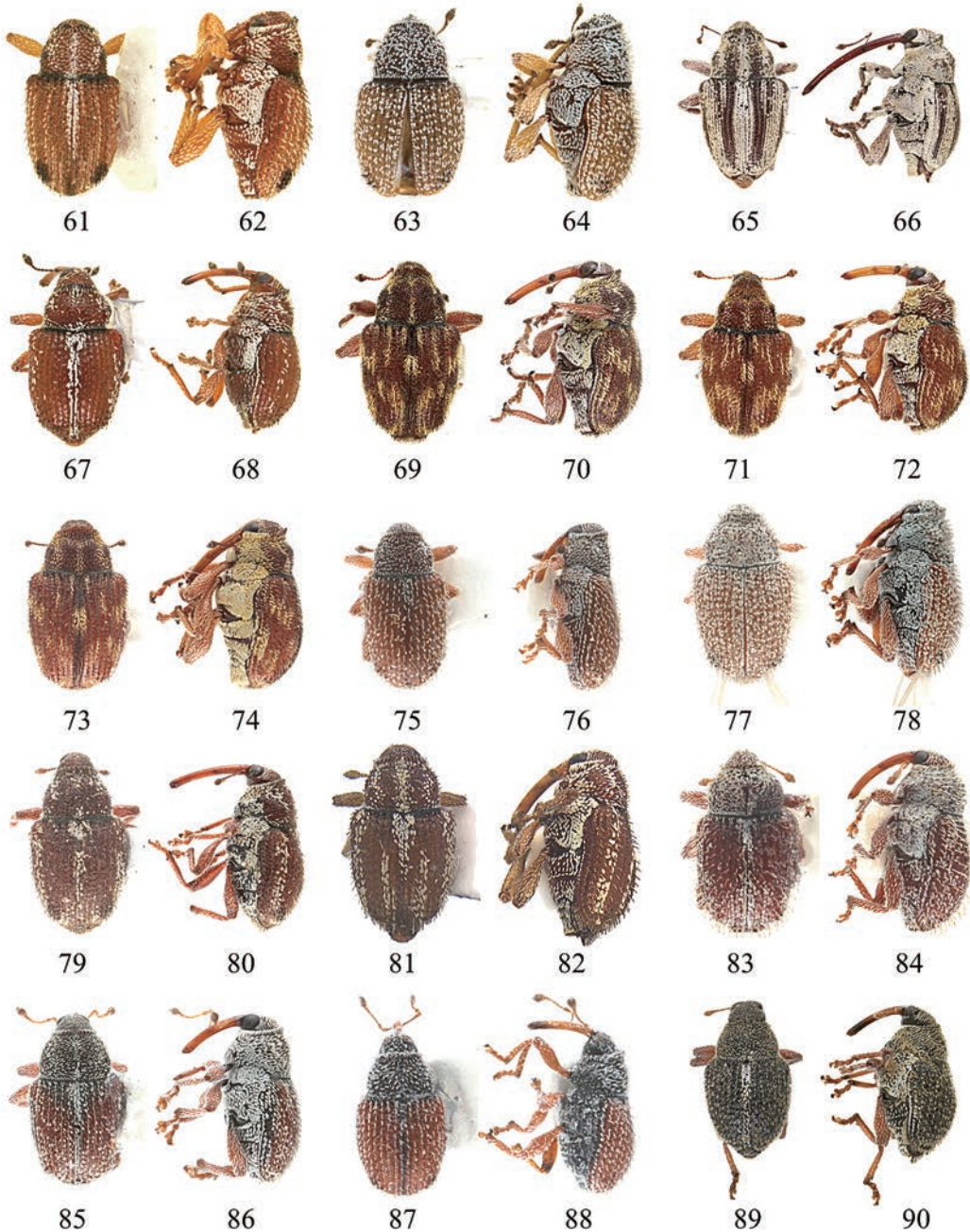
Specimen examined. 1 ex., South Africa to NRT, 18.V.2002, T. YAMADA, on *Berzelia* sp.

Note. The specimen examined was captured on cut flowers of *Berzelia* sp. (Bruniaceae) imported from South Africa.

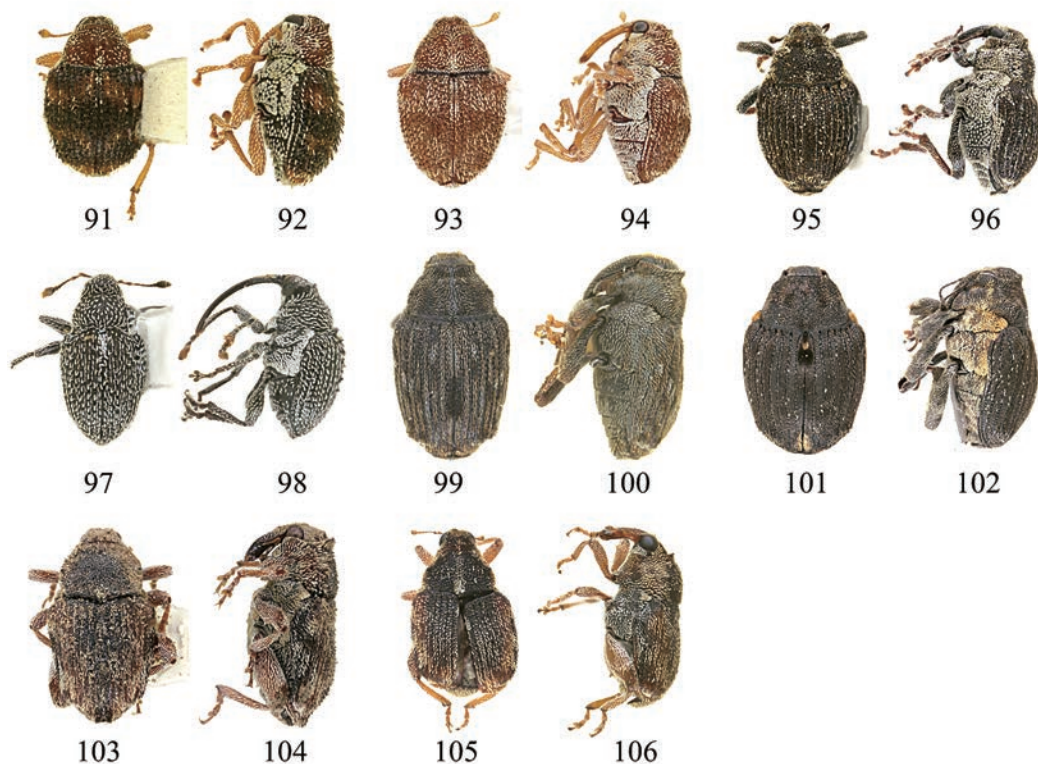
43. *Isorhynchus* (s. lat.) sp. 13

(Figs. 85 & 86)

Specimen examined. 1 ex., South Africa to NRT, 30.XI.2007, M. KAWASAKI, on *Brunia* sp.



Figs. 61–90. Dorsal and lateral habitus of South African Ceutorhynchinae species intercepted at Narita International Airport from 1984 to 2016. — 61 & 62, *Isorhynchus* (s. lat.) sp. 1; 63 & 64, *I.* (s. lat.) sp. 2; 65 & 66, *I.* (s. lat.) sp. 3; 67 & 68, *I.* (s. lat.) sp. 4; 69 & 70, *I.* (s. lat.) sp. 5; 71 & 72, *I.* (s. lat.) sp. 6; 73 & 74, *I.* (s. lat.) sp. 7; 75 & 76, *I.* (s. lat.) sp. 8; 77 & 78, *I.* (s. lat.) sp. 9; 79 & 80, *I.* (s. lat.) sp. 10; 81 & 82, *I.* (s. lat.) sp. 11; 83 & 84, *I.* (s. lat.) sp. 12; 85 & 86, *I.* (s. lat.) sp. 13; 87 & 88, *I.* (s. lat.) sp. 14; 89 & 90, *Micrelus ericae* (GYLLENHAL).



Figs. 91–106. Dorsal and lateral habitus of Ceutorhynchinae species intercepted at Narita International Airport from 1984 to 2016. — 91 & 92, *Micrelus* sp. 1 from South Africa; 93 & 94, *Micrelus* sp. 2 from Zimbabwe; 95–96, *Nedyus quadrimaculatus* (LINNAEUS) from France; 97 & 98, *Scobinoides dentatus* COLONNELLI from South Africa; 99 & 100, *Microplontus rugulosus* (HERBST) from Netherlands; 101 & 102, *Stenocarus cardui* (HERBST) from Italy; 103 & 104, *Hypurus bertrandi* (PERRIS) from Italy; 105 & 106, *Pericartius aequatorialis* (HUSTACHE) from China.

Note. The specimen examined was captured on cut flowers of *Brunia* sp. (Bruniaceae) imported from South Africa.

44. *Isorhynchus* (s. lat.) sp. 14

(Figs. 87 & 88)

Specimen examined. 1 ex., South Africa to NRT, 7.X.2013, A. TAKANO, on *Diosma* sp.

Note. The specimen examined was captured on cut flowers of *Diosma* sp. (Rutaceae).

45. *Micrelus ericae* (GYLLENHAL, 1813)

(Figs. 89 & 90)

Specimen examined. 1 ex., Germany to NRT, 17.X.2008, Y. HIGO, on *Calluna* sp.

Notes. This species occurring in Europe is known to feed on *Calluna vulgaris* and *Erica* spp. (Ericaceae). The specimen examined was captured on a seedling of *Calluna* sp.

46. *Micrelus* sp. 1

(Figs. 91 & 92)

Specimen examined. 1 ex., South Africa to NRT, 18.IX.2010, H. YAZAWA, on *Brunia* sp.

Note. African species of the genus *Micrelus* usually feed on *Rhus* spp. (Anacardiaceae), but the specimen examined was captured on cut flowers of *Brunia* sp. (Bruniaceae) imported from South Africa.

47. *Micrelus* sp. 2

(Figs. 93 & 94)

Specimen examined. 1 ex., Zimbabwe to NRT, 2.III.2001, on *Eryngium* sp.

Note. African species of the genus *Micrelus* usually feed on *Rhus* spp. (Anacardiaceae), but the specimen examined was found from cut flowers of *Eryngium* sp. (Apiaceae) imported from Zimbabwe.

48. *Nedyus quadrimaculatus* (LINNAEUS, 1758)

(Figs. 95 & 96)

Specimen examined. 1 ex., France to NRT, 17.V.2006, H. NAITOU, on savoy cabbage.

Notes. This trans-palaearctic species is associated with *Urtica* spp. (Urticaceae) (COLONNELLI, 2004). The examined specimen found on a cultivar of *Brassica oleracea* (Brassicaceae) might get mixed accidentally during harvest or packing.

49. *Scobinoides dentatus* COLONNELLI, 2007

(Figs. 97 & 98)

Specimens examined. South Africa to NRT: 1 ex., 30.X.2008, T. IMAJYO, on *Berzelia* sp.; 1 ex., 14.IX.2015, T. TOKI, on *Berzelia* sp.

Notes. *Scobinoides dentatus* was described by COLONNELLI (2007) from Cape Province, South Africa. Many adults of *S. dentatus* were collected from flowers of *Erica* spp. (Ericaceae), suggesting strongly that *S. dentatus* is associated with this plant group. The specimens examined were found on cut flowers of *Berzelia* sp. (Bruniaceae).

50. *Microplontus rugulosus* (HERBST, 1795)

(Figs. 99 & 100)

Specimen examined. 1 ex., Netherlands to NRT, 25.VII.1998, on bell pepper.

Notes. This species is widely distributed in the western Palaearctic Region, feeding on Asteraceae plants of the genera *Anthemis*, *Artemisia*, *Chrysanthemum*, and *Matricaria* (COLONNELLI, 2004). The specimen examined was captured on *Capsicum annuum* (Solanaceae), strongly suggesting that it got mixed with the vegetable during harvest or packing.

Table 1. Number of species of Ceutorhynchinae weevils intercepted at Narita International Airport (1984–2016).

Tribe	Origin				
	Europe	Africa	Asia	North America	Oceania
Amalini	1			1	
Ceutorhynchini	10	36 ¹⁾	3	1	
Hypurini	1		1		
Phytobiini					1
Total	12	36	4	2	1

¹⁾ Including undescribed species.

51. *Stenocarus cardui* (HERBST, 1784)

(Figs. 101 & 102)

Specimens examined. Italy to NRT: 1 ex., 23.VI.1999, T. YAMADA, on lettuce; 1 ex., 8.XI.2013, S. NAKAMURA, on chicory. 1 ex., Spain to NRT, 14.VI.2016, E. NARITA, on lettuce.

Notes. This species occurring in the western Palaearctic Region is known to be associated with *Papaver* species (Papaveraceae) and often takes refuge under *Carduus rosettes* (Asteraceae) (COLONNELLI, 2004). The three specimens examined were found on *Lactuca sativa* and *Cichorium intybus* (Asteraceae), although they might get mixed accidentally during harvest or packing.

Tribe Hypurini

52. *Hypurus bertrandi* (PERRIS, 1852)

(Figs. 103 & 104)

Specimen examined. 1 ex., Italy to NRT, 8.XII.2002, S. SUZUKI, on onion.

Notes. This is a widely distributed species known from Africa, Europe, Central and Northeast Asia, Indonesia, Hawaii, USA and Puerto Rico, and is associated with *Portulaca oleracea* (Portulacaceae) (COLONNELLI, 2004). The examined specimen taken from *Allium cepa* (Alliaceae) might get mixed accidentally during harvest or packing.

53. *Pericartius aequatorialis* (HUSTACHE, 1934)

(Figs. 105 & 106)

Specimen examined. 1 ex., China to NRT, 18.XI.2015, N. SAITO, on shiso.

Notes. This African species is distributed in Congo, South Africa, St. Helena, and Madagascar (COLONNELLI, 2004). In addition, a female specimen intercepted in 1991 by plant inspection at Anchorage, Alaska is considered to have originated from Korea (HONG *et al.*, 2000). This species is known to be associated with *Amaranthus hybridus* and *Suaeda fruticosa* (Amaranthaceae) (COLONNELLI, 2004). The examined specimen taken from *Perilla frutescens* var. *crispa* (Lamiaceae) might get mixed accidentally in the distribution process, though its occurrence in China is uncertain.

Table 2. Number of interceptions of Ceutorhynchinae weevils at Narita International Airport (1984–2016).

Tribe	Origin	Associated plant			Total
		Cut flower	Vegetable	Live plant	
Amalini	North America	1			1
	Europe		1		1
Ceutorhynchini	Africa	128			128
	Asia		9		9
	Europe		30	1	31
	North America		2		2
Hypurini	Asia		1		1
	Europe		1		1
Phytobiini	Oceania		1		1
Total		129	45	1	175

Discussion

Among the Ceutorhynchinae intercepted at NRT from 1984 to 2016, the dominant group is by far in the tribe Ceutorhynchini, identified from 97 % of the total number of interceptions and 92 % (49 spp.) of species inspected (Tables 1 & 2). In contrast, just a few examples of Amalini (1 sp.), Hypurini (2 spp.), and Phytobiini (1 sp.) have been found from non-host plants, indicating that they were occasionally mixed with imported goods at harvest.

The regional origins of specimens examined in this study were Africa, Europe, East Asia, Oceania, and North America. The origin with the largest number of species was Africa (36 spp.), followed by Europe (12 spp.). The most frequent interceptions were from cut flowers from South Africa (73 %) and vegetables imported from Europe (17 %).

Ceutorhynchini weevils including well-known pests of crucifers, such as *Ceutorhynchus erysimi*, *C. obstructus*, *C. pallidactylus*, and *C. picitarsis*, have been found continuously from European cruciferous vegetables. They are especially important for Japanese plant quarantine because the risks of their establishment and spread in Japan are considered to be relatively high on account of similarities in flora and climate of Japan to those of Europe. The other Ceutorhynchini species taken from vegetables from Europe seem to be occasionally mixed with imported goods during harvest or the packing process, since they have been found from non-host plants.

Also, Ceutorhynchini weevils have frequently been intercepted from cut flowers of plants of the families Bruniaceae, Proteaceae, and Rhamnaceae imported from South Africa. Most of them were undetermined at the species level, but belong to the genus *Isorhynchus* in its present broad sense, including many undescribed species. In spite of their frequent interceptions, they are very difficult to identify due to insufficient taxonomic studies. In addition, their ecological traits including host plant associations are still unknown. Therefore, further taxonomic and ecological research on African Ceutorhynchini will promote quick and accurate species identification during plant inspections and evaluation of the plant quarantine importance of these species to Japan.

要 約

吉武 啓・源河正明・Enzo COLONNELLI：横浜植物防疫所成田支所における輸入検疫で発見されたサルゾウムシ類（鞘翅目ゾウムシ科）。——— 成田国際空港における輸入植物検疫で1984年から2016年にかけて発見されたサルゾウムシ類の標本53種224点の目録を作成し、各標本の発見状況を記録した。族レベルでの種数はサルゾウムシ族 *Ceutorhynchini* が最も多く、全体の92%（49種）を占める他、少数ながらクチブトサルゾウムシ族 *Phytobiini*（1種）や *Amalini* 族（1種）、スベリヒユサルゾウムシ族 *Hypurini*（2種）が含まれる。原産地域別の種数を見ると、ヨーロッパ産（12種）とアフリカ産（36種）が最も多かった。標本の原産地域は、アフリカおよびヨーロッパ、東アジア、北米、オセアニアであり、そのうち南アフリカ産切り花からの発見件数が全体の73%を占め、次いでヨーロッパ産野菜からの発見件数が17%と多かった。多くの農業害虫を含み、日本への定着リスクも高いヨーロッパ産サルゾウムシ族が、特に植物防疫上重要であると考えられる。また、南アフリカ産サルゾウムシ族は輸入検疫での発見件数が最も多いにも関わらず、多数の未記載種が含まれるため種までの同定が困難かつ日本への定着リスクも未知数であり、今後の分類学的研究の進展や基礎的な生態情報の集積が望まれる。

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