

# The Dermaptera of Canada

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## Order DERMAPTERA.<sup>1</sup>

### The Earwigs.

- 1815—**Dermaptera** Leach, Edin. Encycl. IX.  
 1829—**Forficulidae** Steph., Cat. Brit. Ins. Vol. 1, p. 299.  
 1831—**Euplekoptera** Westw., Zool. Jour, No. XIX.  
 1834—**Forficulina** Newm., Ent. Mag. Walker, Vol. 2, p. 424.  
 1838—**Dermatoptera** Burm., Hanb. Ent., Vol. 2, p. 743.  
 1839—**Euplexoptera** Westw., Introd. Class. Ins., Vol. 1, p. 398.  
 1882—**Forficularia** Brunner. Prodr. Eur. Orth., p. 1.  
 1893—**Forficuloidea** Bolivar. Rev. Biol. Nord. Fr. Vol. 5, p. 477.

(Other names, which have been occasionally used, it is unnecessary to quote.)

Due perhaps to the fact that in themselves the earwigs form a well-defined natural group, there has been some considerable difference of opinion amongst entomologists with regard to their relationship to other insects. Many species in general appearance are very like beetles, and Burr<sup>2</sup> speaks of **Labia minor** Linnaeus as flying with and mimicking certain Brachelytra. We are not, therefore, surprised to find that Linnaeus classed them with the Coleoptera (Lucas.)<sup>3</sup>

This small group of insects, consisting of some five hundred species, mostly tropical or semi-tropical, popularly called earwigs, and known in scientific terminology as Dermaptera, Euplexoptera or Forficulidae, is at the present time usually given ordinal rank.<sup>4</sup> Some systematists, however, consider that they should constitute a sub-order<sup>5</sup> or a family<sup>6</sup> of the order Orthoptera.

<sup>1</sup>Dermaptera: derma, skin; pteron, a wing.

(De Geer proposed this name for the whole of the Orthoptera. "Mem. pour serv. a l'Hist. d'Ins." I. Orth. Vol. III. 1773.)

<sup>2</sup>Burr. Ent. Rec. XI. No. 2. 1899.

<sup>3</sup>Lucas. Brit. Orth. p. 7. 1920.

<sup>4</sup>Morse. Manual Orth. New Eng. (Proc. Boston. Soc. Nat. Hist. Vol. 35. p. 283. 1920.)

Comstock. Int. Ent. p. 460. 1925.

Imms. Textbook Ent. p. 238. 1925.

Essig. Ins. West. N. Amer. p. 63. 1926.

<sup>5</sup>Blatchley. Orth. North-eastern Amer. p. 42. 1920.

Lucas. Brit. Orth. p. 7. 1920.

<sup>6</sup>Lugger. Orth. Minn. p. 3. 1897.

Apparently the geologic history of these insects does not certainly extend back beyond Tertiary times. An insect, **Baseopsis forficulina** Heer, has been obtained from the Lias in Switzerland,<sup>7</sup> but entomologists generally do not consider it to be an earwig. Above the Chalk, however, in Tertiary formations of Oligocene and Miocene times, earwigs certainly occur, and Scudder has not long since described a dozen species of one genus from the Lower Miocene beds of Florissant alone. Sometimes the wings were expanded, and we gather that the insects have changed little in appearance, size, wing-form, and wing expanse. The callipers, however, seem to have been decidedly less conspicuous than at present (Lucas.)<sup>8</sup>

The common name earwig was given to these insects in England, and has reference to a widely spread fancy that these insects creep into the ears of sleeping persons. Other similar names are applied to them in Europe, **Ohr-Wurm** in Germany, and **Perceoreille** in France. On the other hand, it has been suggested that the work is a corruption of "ear-wing" in allusion to the form of the hind wings.

Earwigs are small or of moderate size; the living species measuring from 2.5 to 3.7 mm. in length. The body is narrow and flat. The head is short, more or less heart-shaped, and horizontal; mandibles strong, fitted for chewing, and resemble in their more general features those of the Orthoptera. The antennae are slender, and consist of from ten to thirty-five segments; the second segment is always very small. The compound eyes are rather large; but the ocelli are wanting. Forewings modified into very short leathery tegmina devoid of veins; hind wings semicircular, membranous, with the veins highly modified and disposed radially. When the wing is not in use, that part over which the radiating veins extend is folded in plaits like a fan, after which the wing is folded twice crosswise. Many species are wingless. The legs are of nearly equal size, the hind femora not enlarged; tarsi never more than three-jointed and usually without pads between the claws. The abdomen is elongate, the arrangement of the segments being imbricate, and the abdomen being terminated by cerci, which take the form of callipers or forceps. Certain earwigs possess stink-glands, which open through tubercles situated one on each side near the hind margins of the second and third visible abdominal segments; from which, it is said, they can squirt a foul-smelling fluid to a distance of three or four inches.

The forceps or pincers are homologous with the cerci of other insects, and are characteristic of the order. They are usually more highly developed in the male than in the female and young (in which

<sup>7</sup>"Die Urwelt der Schweiz," by Prof. Oswald Heer. 1865

<sup>8</sup>Lucas. Brit. Orth. p. 7. 1920.

they are much alike) in some exotic species being of extraordinary size and exceedingly odd form. They are sometimes assymmetrical, or even dimorphic in the same sex. (Plate 1, fig. 2, e.) Fulton says: "The use of this most characteristic part of the earwig's anatomy is often referred to in works on entomology as "obscure" and authors prefer to pass over the subject with a few very general remarks. From a review of the literature on earwigs and from studies of living material of two species, there is no longer any doubt in my mind but that the forceps are very useful organs and that their function varies to some extent with the species. The most important use seems to be that of defence."<sup>9</sup> Several species of earwigs have been said to use the forceps as a means of offence against other insects. Bennett<sup>10</sup> says that he has seen the Maritime earwig, **Anisolabis maritima**, (Géné) in cages chase and catch with their forceps crickets, sand-fleas and smaller earwigs and devour them while still holding them with the forceps. Sopp<sup>11</sup> describes a case in which a female **Labidura riparia** (Pallas) captured with her forceps and devoured a blue bottle fly which had alighted near her hiding place. Later he saw a male thrust its forceps backward into a hollow among some sea-weed and pull out a large fly which was squeezed to death by the forceps as he dragged it away. The fly was held in the forceps until nearly half eaten. Fulton has clearly shown that the forceps are used for opening and closing the wings in the case of **Forficula auricularia** Linnaeus and **Labia minor** (Linnaeus), the latter species being unable to take flight if the forceps are cut off. He has also clearly shown that the forceps of the male are not used as claspers during the act of copulation; this has been further substantiated by Morgan.<sup>12</sup> The forceps of the females of almost all earwigs are shorter than in the males, being, as a rule, straight and unarmed.

A few technical terms, other than those common to their close relatives, the Orthoptera, need explanation and are well described by Morse.<sup>13</sup> The large plate at the end of the abdomen above is called the **anal plate** or **last dorsal plate**; a similar one on the under side is the **penultimate ventral segment**, the ultimate showing only as two triangular plates between the bases of the prongs of the forceps, extending downward and sometimes forward; rarely, it is fused with the anal plate (**Labidura riparia** Pallas.) Attached to its lower (**posterior**) end is another, the **metapygidium**, which is followed by the **telson** or **supra-anal plate**. These three plates are termed **opisthomeres** and their rela-

<sup>9</sup>Fulton. "Some Habits of Earwigs." Ann. Ent. Soc. Amer. Vol. 17. p. 357. 1924.

<sup>10</sup>Bennett. Psyche. Vol. 11. 47-53. 1904.

<sup>11</sup>Sopp. 28 Ann. Rep. Lancashire and Cheshire Ent. Soc. 38-43. 1904.

<sup>12</sup>Morgan. Proc. Ind. Acad. Sci. Vol. 34. p. 347. 1925.

<sup>13</sup>Morse. Manual Orth. New. Eng. p. 284. 1920.

tive development is a character used in classification. Sometimes the last dorsal segment is prolonged backward to form a **squamopygidium** whose hind margin is termed the **anal process**. The hinder ones are often greatly reduced in size and visible only with difficulty in dried specimens.

"The most useful characters for distinguishing species are found in the forceps of the male; indeed, without male specimens the identification of closely allied earwigs is impossible. The form of the pygidium and that of the last visible abdominal segments perhaps comes next in importance; and the characters presented by the tarsi, the proximal segments of the antennae, and the tegmina and wings are much used."

The metamorphosis is gradual, the young resembling the adult in form, except that the forceps are simple and more or less styliform. The wings develop externally.

Female earwigs take great care of their eggs and newly hatched young and jealously guard them from harm; an unusual thing in the more ancient orders of insects. Writers from De Geer (1773) onwards have commented on this habit, and H. Gateau de Kerville has collected much of the information, and given to the world an interesting paper.<sup>14</sup> Other writers have recently written interesting articles on this subject.<sup>15</sup>

The food of earwigs has generally been stated to be vegetable in character, but some species are undoubtedly carnivorous, and predatory, and probably will be found, when studied, to be omnivorous. Some species, such as the European earwig, are serious garden pests and damage the blossoms of plants such as phlox, dahlias and roses.

During the day earwigs hide away in cracks and crannies in walls and floors, beneath rubbish and the loose bark of logs and stumps, or between the bases of the leaves and the stems of rushes and grasses, coming forth at dusk to feed.

Ancient lore is replete with all kinds of cures attributed to various insects and some relating to **Dermaptera** and **Orthoptera** are given here. Cockroaches, bruised and mixed with sugar, cure ulcers and cancers, and kill worms in children, and ashes of burned roaches are an effective physic,<sup>16</sup> and the inner viscera of roaches boiled in oil cure earache.<sup>17</sup>

<sup>14</sup>G. de Kerville. "Accouplement, oeufs, et amour maternel des Forficulides." Rouen, 1907.

<sup>15</sup>Fulton. "Some Habits of Earwigs." *Ann. Ent. Soc. Amer.* Vol. 17. p. 357. 1924. (See previous page.)

<sup>16</sup>Sauche. "Datos para la Medica Mexicana." (1893.)

<sup>17</sup>Sloan. *Hist. Jamaica.* Vol. II. p. 204. (1707-25.)

Cockroaches are made into tea and formed into pills for various ailments of man, and, powdered and extracted in alcohol, they are a remedy for dropsy.<sup>18</sup> Oil of forficulids (earwigs) rubbed on the temples, wrists and nostrils strengthens the nerves; ashes of house crickets cure weak sight and enlarged tonsils, and triturated bodies of migratory locusts, with proof spirits, cure haemorrhoids and quench thirst.<sup>19</sup>

Earwigs are cosmopolitan insects, and are easily transported by commerce; consequently exotic species are liable to be found near seaports, and some such species have become established in Canada. There are some fifteen native or established species of earwigs at present known from America, north of Mexico. In Canada we have definite records of five species, but only one, **Doru aculeatum** (Scudder), can be considered native.

Family **LABIDURIDAE**

Sub-family **Psalinae**

Genus **Anisolabis** <sup>20</sup>Fieber

1853—**Anisolabis** Fieber. Lotos. Vol. 3, p. 257.

1862—**Forcinella** Dohrn. Stett. Ent. Zeit. Vol. 23, p. 226.

1864—**Brachylabis** *ibid.* Vol. 25, p. 292. (partim.)

Body long, rather slender, wholly apterous, of nearly equal width throughout; antennae scarcely half the length of body; second and third abdominal segments often with small lateral folds or tubercles; subgenital plate rounded, male, triangular, female; forceps short, pointed, the right leg curved in more than the left, male; short and nearly straight, female.

**Anisolabis maritima** (Géné) (Plate 1, Fig. 1e.) **The Maritime Earwig.**

1832—**Forficula maritima** Géné. Ann. Sci. di Regno Lombardo—Veneto, Padova, Vol. 2, p. 215.

1853—**Forficula (Labidura) maritima** Fischer. Orth. Eur., p. 68.

1853—**Forficesila maritima** Serville. Ins. Orth., p. 27.

1853—**Anisolabis maritima** Fischer. Lotos. Vol. 3, p. 257.

1864—**Brachylabis maritima** Dohrn. Stett. Ent. Zeit. 25, p. 293.

Blackish or dark mahogany brown; legs and under surface yellowish; dorsal surface smooth, waxen, minutely punctate; antennae pale brownish-yellow, pubescent, 20-24 jointed, about one-half as long as body, without forceps. No visible trace of tegmina or wings. Anal

<sup>18</sup>Bogomolow. St. Petersb. Med. Wochenschr. (1884.)

<sup>19</sup>Ealand. "Insects and Man." p. 217. (1915.)

<sup>20</sup>Greek. "Unequal" + "forceps."

plate of male about twice as wide as long, quadrate; of female a little narrower and narrowed behind. Forceps of female and young nearly straight, gently arcuate at tip, the inner margin of the basal half crenulate; of male a little shorter, more arcuate, less finely pointed at tip and assymmetrical, the right member being more accurate, and its inner basal process broader, the inner margin faintly denticulate at base (Plate 1, Fig. 2a.) Total length of body and forceps in British Columbia specimens 20-28 mm.

This large earwig is a cosmopolitan species of world-wide distribution, its range having undoubtedly been widely extended by commerce. It has been recorded from North America, Mexico, Bermuda, Ecuador, Canary Islands, West Indies, Japan, New Zealand, and probably occurs at many other points. In North America it has been recorded on the Atlantic coast from Maine to Texas, and on the Pacific coast in British Columbia.

This earwig was first recorded from Canada by Professor G. J. Spencer,<sup>21</sup> who took it in considerable numbers on a small island three miles out from Departure Bay, Nanaimo, and on the mainland of Vancouver Island just near the Biological Station. It was discovered at the end of May, 1926, in coarse gravel at high tide mark, living in a narrow belt some two feet wide where the water had deposited a strip of seaweed and flotsam. The insects seemed restricted to this narrow, damp belt, hiding under logs or masses of dead seaweed or burrowing down into the gravel.

The author has since collected several hundred specimens at Departure Bay and found them restricted to the seaweed belt, as did Professor Spencer.

In early June, 1928, Mr. Arthur Gibson, Dominion Entomologist, and Mr. W. Downes, of the Victoria Entomological Laboratory, found many specimens in this locality in all stages of development, and in August the author found at least 75% still immature.

The collection of adults showed that males were scarce, the females outnumbering them by ten to one. Two females were found in damp sand beneath a log in large flat cells; one was guarding a pile of sixty-five oval yellowish white eggs, and the other a newly hatched brood of young. They are not known to occur at any other point on the coast of Vancouver Island or on the mainland of British Columbia at the present time. They were probably introduced to Departure Bay by Japanese fishing boats, as there is a considerable trade in herrings from this point to the Orient.

<sup>21</sup>Spencer. Can. Ent. Vol. 58. No. 8. p. 183. 1926.

An interesting paper on the habits of this species, by C. B. Bennett,<sup>22</sup> appeared in *Psyche*, from which the following account has been condensed:

The colony of Maritime earwigs, from which these observations were made, were found near Cold Spring Harbour, N. Y.

Eggs were laid mainly in the warmer months of July and August and only a very few after the middle of September. After about seventeen days—although the time varied with varying conditions of temperature, humidity, etc., the young emerged from the egg.

Female adults are, as a rule, longer and otherwise larger than the males. The size of the full-grown insects which I have seen varied from 16 mm. to nearly 35 mm. The females were three or four times as numerous as the males. These earwigs seem to be capable of great endurance. They are accustomed to live near water, and when disturbed they frequently enter the water, and, when frightened, would crawl to the underside of some floating object and hide themselves under water. One was observed to remain submerged for 65 minutes without harm. They easily succumb to lack of water; if kept in a dry place they soon die.

These earwigs are at least partly carnivorous, and any insect not protected by too tough a covering will serve them as food; they probably act as scavengers on the shore. When walking over wet ground, the earwig so twists its heavy abdomen that the narrow side rather than the flat bottom would come in contact with the ground and thus serve as a runner to support its weight.

As already mentioned above, the Maritime earwig makes free use of its forceps in defending itself and also offensively in securing and holding its prey. A very severe nip can be given the finger by a large male of this species, the pressure applied being truly remarkable for so small an insect.

The Maritime earwig is an adventive species which seems to have become firmly and permanently established at Departure Bay, Nanaimo, on the east coast of Vancouver Island. From this point it will probably be spread to other points on the coast of British Columbia. From its restricted habitat it is never likely to become of economic importance to mankind.

Genus **EUBORELLIA** Burr

- 1909—**Borellia** Burr, *Deutsche. Ent. Zeitschr.* p. 325. (Preoccupied.)  
1910—**Euborellia** Burr, *Trans. Ent. Soc. Lond.* Pt. 3. p. 179.

<sup>22</sup>Bennett. *Psyche*. Vol. 11. p. 47. 1904.

This genus was erected by Burr in 1909 under the name **Borellia**, for those species, formerly included in **Anisolabis**, with distinct rudimentary elytra which are never free, but attached to the mesonotum. This name was later found to be preoccupied, and the name **Euborellia** was substituted. At first **annulipes** was not included in this genus by Burr, but was removed from **Anisolabis** on finding specimens with rudimentary elytra. Later, a remarkably fully winged aberration of **annulipes** was discovered, which again upset the generic characters and the genus **Euborellia** was then defined by Burr by characters of the genitalia of the male. Some systematists consider the inclusion of **annulipes** in this genus unsatisfactory, but as it is now usually so placed, it is here placed under **Euborellia**.

**Euborellia annulipes** (Lucas) (Plate 1, Fig. 1c.)

The Ring-legged Earwig.

- 1847—**Forficelisa annulipes** Lucas. Bull. Soc. Ent. France. (2) v p. 84.  
 (Jardin des Plantes, Paris.) (Probably introduced.)  
 1853—**Forficula annulipes** Fischer. Orth. Europ. p. 69. Tab. VI., Fig. 6.  
 1864—**Forcinella annulipes** Dohrn. Stett. Ent. Zeit. Vol. 25, p. 290.  
 1882—**Anisolabis annulipes** Brunner. Prodr. Eur. Orth. p. 8.  
 1911—**Eurboellia annulipes** Burr. 122d Fas. Gen. Ins. p. 30.

(Burr gives the following synonyms: **bormansi**, Scudder; **antoni** Dohrn; **antennata** Kirby; **annulicornis** Blanchard; **variicornis** Smith; **apronoma** Borelli.)

Medium sized, black, shining; head black; antennae 15-16 jointed, with basal segments reddish, the rest greyish-brown, except the two penultimate segments, which are whitish. Pronotum broad as the head, sometimes paler in colour, quadrate; elytra and wings usually entirely absent. Abdomen with sides more or less parallel, with no tubercles upon the sides of the second and third segments. Last dorsal segment larger than the others, slightly impressed in the middle. Feet testaceous, the femora banded with black, as are also the tibiae. The depth and intensity of this banding varies very considerably. Branches of the forceps in the male remote at the base, stout, strongly incurved, the right branch crossing above the left at the apex; in the female the branches are straight, conical, subcontiguous; (Plate 1, Fig. 2b.) total length 12-16 mm.

This is a cosmopolitan species widely distributed by commerce. It has been recorded from France, Italy, England, North America, Mexico, Bermuda, Brazil, Paraguay, Guatemala, Guadeloupe, Trinidad, Cuba, Hawaii, Ceylon, Algeria, and probably occurs in many other countries.



In North America adventive material has been recorded from Massachusetts, Connecticut, Pennsylvania, and the District of Columbia, and it is said to be established along the coast from North Carolina to Texas. On the Pacific Coast it occurs fairly commonly on the coast of southern California and at Victoria on Vancouver Island, British Columbia.

The first record of this species for Canada was in 1916 when two specimens of this earwig were taken on board ship in Vancouver docks by Treherne.<sup>23</sup> Since that date a colony has been found, which seem to be well established, in the gardens of the Empress Hotel in Victoria. This colony has been under observation since 1927. They are found mainly in the gardener's sheds and refuse heaps.

This species is not restricted to the sea shore like the preceding species, but may occur further inland. It is found usually beneath rubbish in both dry and damp situations. It is not known in any other locality in Canada, as far as I am aware, but can be considered as an established adventive in Victoria, British Columbia. It is not, however, likely to become of economic importance in Canada.

Family **LABIIDAE**

Sub-family **Labiinae**

Genus **Labia**<sup>24</sup> Leach

1815—**Labia** Leach. Edinb. Encycl. IX. p. 118.

1853—**Copiscelis** Fieber. Lotos. Vol. 3, p. 257.

Body flattened, slender, the abdomen slightly widened at middle, head narrow, the sutures subobsolete; eyes small, not as long as first antennal segment; antennae about half as long as body, 10-13 jointed, the segments obconical, about three times as long as broad; tegmina and wings present in the Canadian species; first and third tarsal joints equal, the second minute, simple, compressed forceps seldom more than half as long as abdomen, those of male slightly or strongly curved, horizontal; of female simple, straight, incurved at tip, usually unarmed.

**Labia minor** (Linnaeus) (Plate 1, Fig. 1a.) The Little Earwig.

1758—**Forficula minor** Linnaeus. Syst. Nat. ed. 10. Vol. 1, p. 423.

1816—**Labia minor** Leach. Edinb. Encycl. VIII., p. 707.

1862—**Labia minuta** Scudder. Bost. Jour. Nat. Hist. Vol. 7, p. 415.

1867—**Forficesila minor** Friv. Orth. Hung. p. 46.

<sup>23</sup>R. C. Treherne took two specimens on the SS. Talthybius—a Blue Funnel liner—in Vancouver docks in February, 1916.

<sup>24</sup>Labia (Greek, "a holder or forceps.")

Body thickly clothed with fine yellowish pubescence. Antennae 12-segmented, hair brown, the last two or three segments subcylindrical or fusiform. Pronotum as long as head, but narrower, rounded posteriorly; tegmina as wide as pronotum, and nearly twice as long, obliquely truncate, posteriorly. Exposed part of wings half as long as tegmina, rounded postero-laterally. Exposed part of abdomen varying from one-third as long to equal to the tegmina. Hind margin of last dorsal segment of male with a pair of small tubercles near mid-line. Forceps of male about four-fifths, of female about two-thirds, as long as tegmina, of male widened internally near base by a slight angular process, separated at base by a space nearly equal to their basal width, arcuate, their inner margin roughened by nine or ten minute, backward-pointing denticulations; of female a little shorter than in male, flattened at base; attinent throughout, without denticulations (Plate 1, Fig. 2c.) In the male a chitinous backward-pointing process arises from the middle of the last visible ventral segment, its ventral margin curving gently upward to the tip. Head and sides of abdomen dark brown, deepening to blackish. Pronotum, tegmina, and exposed wing tips light to medium dark hair-brown. Forceps and dorsal median third to half of abdomen chestnut, deepest on forceps; total length, 5-7 mm.

This tiny earwig is a native of the Palaearctic region, and is common throughout Europe. It has been introduced into North America and is now firmly established there. In Africa it is to be found in Cape Colony, as well as from Somaliland to the Congo. It is very common in England and sometimes swarms in the sunshine over old dungheaps. It is recorded also from Madeira, Philippines and the Galapagos Islands.

In North America it is known from all the New England States, and from Virginia, North Carolina, Ohio, Indiana, Minnesota, South Dakota, Florida and California and probably occurs in many other states. In Canada we have records of its capture from New Brunswick, Quebec, Ontario, Manitoba and British Columbia.

Morse<sup>25</sup> states that: "It is known from all the New England States, and has been taken in every month, from May 25th to Nov. 4th, and under a wide variety of circumstances; from stables, manure-heaps, and fungi; flying about in the late afternoon, at dusk, and to lights in the evening. It has been charged with eating the tender corollas of flowers, but it is probably first of all a scavenger and attacks flowers from second choice or in the absence of other food."

This is one of the few earwigs which makes free use of its wings and is also attracted to light in the evenings. Fulton<sup>26</sup> found that the

<sup>25</sup>Morse. Manual Orth. New Eng. (Proc. Boston Soc. Nat. Hist. Vol. 35. p. 293. 1920.)

<sup>26</sup>Fulton. "Some Habits of Earwigs." Ann. Ent. Soc. Amer. Vol. 17. p. 357. 1924.

forceps are necessary for flight in this species. A male which had made several flights without difficulty, using its forceps to expand its wings, had its forceps cut off, leaving short stumps. This male made repeated efforts to fly, but was unable to open either wing.

This is the only Canadian earwig with a wide distribution within the Dominion, and, on account of its small size, is seldom found.

Family **FORFICULIDAE**

Sub-family **Forficulinae**

Genus **Doru**<sup>27</sup> Burr

1907—**Doru** Burr. Trans. Ent. Soc. Lond. p. 123.

Antennae with segments three and four nearly equal; pronotum longer than wide; inner wings (in our species) rudimentary; abdomen subparallel, feebly dilated; pygidium of male armed with a distinct spine.

**Doru aculeatum** (Scudder) (Plate 1, Fig. 1b.)

The Spine-tailed Earwig.

1862—**Forficula aculeata** Scudder. Proc. Bost. Soc. Nat. Hist. Vol. 18, p. 262.

Dark chestnut brown; palpi, legs, edges of pronotum and outer two-thirds of tegmina yellow. Pronotum longer than broad, narrower than head. Tegmina nearly twice as long as pronotum, truncate; inner wings usually aborted and hidden beneath the tegmina. Forceps of male, three-fourths as long as abdomen, slender, curved, bent downward a little at basal third, becoming again horizontal a little before the tip, a pointed tooth present at second bend; of female shorter than those of male, their legs nearly straight, the lower inner edges very finely crenulate and usually contiguous for most of their length, the tips incurved (Plate 1, Fig. 2d.) Total length, 11-17 mm. Length of pygidial spine of male, .8-1 mm.

This earwig is a native of North America, and has never been found outside the United States<sup>28</sup> and Canada. In the United States it occurs in Michigan, Nebraska, Illinois, Indiana, Ohio, New York, Pennsylvania, New Jersey, Virginia, North Carolina, Georgia and Louisiana. In Canada it has been recorded only from extreme southern Ontario, at Point Pelee, where it was swept from tall rushes by N. K. Bigelow in July, 1920.

<sup>27</sup>*Doru* (Greek "spear.")

<sup>28</sup>Rehn and Hebard. Jour. N. Y. Ent. Soc. Vol. 22, p. 89. 1914.

Fox<sup>29</sup> states that it is found frequently on tall reeds in tidal marshes in Virginia, occasionally spreading to nearby timothy pastures. Blatchley<sup>30</sup> took it in Indiana from between the bases of the leaves of skunk cabbage, *Spathyema foetida* (Linnaeus.) He states that "they were below the surface of the ground, one to five in each clump of the plant, usually in pairs, resting head downward in the groove which extends along the petiole of the leaf."

Little seems to have been recorded about the habits and life-history of this species. It is normally brachypterous, but occasionally macrop-terous specimens are found. It is the only earwig which can be considered a true native of Canada and probably will not be found outside extreme southern Ontario.

#### Genus *Forficula*<sup>31</sup> Linnaeus

1758—*Forficula* Linnaeus. Syst. Nat. ed. 10. Vol. 1, p. 423.

Antennae in our species 14-15 jointed, the fourth joint obconical, half the length of third; 7-14 cylindrical, more than four times as long as broad; pronotum almost square, the hind angles rounded; wings slightly surpassing tegmina; abdomen not expanded at middle, the third and fourth dorsal segments with lateral folds; first tarsal joint slightly longer than third; second short, dilated, and lobed at apex, passing beneath the third.

#### *Forficula auricularia* Linnaeus (Plate 1. Fig. 1d.)

The European Earwig.

1758—*Forficula auricularia* Linnaeus. Syst. Nat. ed. 10. Vol. 1, p. 423.

"Other synonyms are *F. major* De Geer, *F. dentata* Fabr., *F. parallela* Fabr., *F. infumata* Megerle, *F. cyclolabia* Schm., *F. macrolabia* Schm., and *F. lurida* Fisch., *F. neglecta* Marsham is an ordinary female; *F. media* Marsham is *F. auricularia* L. with rather longer callipers than those of the usual form; *F. borealis* Steph. has still longer callipers; *F. forcipata* Steph. has very long callipers."<sup>32</sup>

Antennae 11-14 segmented, brown, about two-thirds as long as body. Pronotum shield-shaped, front margin straight, sides straight and parallel, rounded smoothly into hind margin, which is strongly convex. Tegmina about one and on-third times as long as pronotum; exposed part of wings half as long as tegmina.

<sup>29</sup>Fox. Proc. U. S. N. M. No. 52, p. 206. 1917.

<sup>30</sup>Blatchley. Jour. N. Y. Ent. Soc. Vol. 32, p. 127. 1924.

<sup>31</sup>*Forficula*—Latin "scissors."

<sup>32</sup>Lucas. Brit. Orth. p. 40. 1920.

Glandular tubercles on side of terga of abdominal segments 3 and 4 (second and third visible.) Anal plate of male twice as wide as long, quadrate, with a pair of low, broad, rounded elevations near hind margin equi-distant from margin and mid-line; lateral margins strongly compressed, reflexed upward; hind margins slightly bisinuate convex. Anal plate of female a little narrowed behind, the details of conformation described for the male less pronounced.

Forceps of male arcuate, calliper-like from wide and flat bases; the outer margin sinuate, the inner margin armed at base with several small teeth, a large and prominent one at the quarter or third, directed backward and inward. The males are dimorphic in length of forceps, one series averaging about 4 mm., the other about 7 mm. Forceps of female but little depressed at base, inner margins straight, attingent, the tips a little arcuate, delicately pointed (Plate 1. Fig. 2c.) Forceps of nymph slender throughout, not widened at base, sinuate, less acutely pointed at tip than in the female.

Colour varying widely from yellowish to fuscous, usually darkest on the sides of the abdomen and disc of pronotum; the head, legs, and forceps usually paler; the sides of the disc of the pronotum, sides of exposed portions of wings, and variable amounts of the sides and dorsum of pronotum, pallid or luteous. Total length 16-23 mm.

The European earwig is found commonly in England, France, Holland, Norway and Germany, and has been carried by commerce to North America, South America, New Zealand, Tasmania, North Africa, Western Asia, Cuba and Madeira. It is liable to occur wherever steamships ply regularly from European ports.

Adventive specimens of this cosmopolitan species have been recorded a number of times from the eastern United States, but it did not become established until about 1912, when a colony appeared at Newport, Rhode Island, which was first reported by Glaser.<sup>33</sup> Blatchley<sup>34</sup> records that this species increased so rapidly at Newport and threatened to become such a pest that a special bulletin<sup>35</sup> treating of it was prepared and issued by the U. S. Bureau of Entomology. It has also been found in numbers at East Aurora, N. V.

On the Pacific Coast it has now become firmly established and is a serious garden and household pest. Fulton<sup>36</sup> states that: "Records show that the earwig has been present in Oregon since 1909. A specimen which was identified as an earwig was sent to this Experiment Station

<sup>33</sup>Glaser. *Psyche*. Vol. 21. No. 5. p. 157. 1914.

<sup>34</sup>Blatchley. *Orth. N.-east Amer.* p. 57. 1920.

<sup>35</sup>Jones. *Bull.* 566. U. S. Dept. A. June 18, 1917.

<sup>36</sup>Fulton *Bull.* 207. *Oreg. Ag. Coll.* 1924.

in 1910 from Albany, Oregon, accompanied by a letter in which the writer claimed that the insect had been a pest during the previous summer also. Little more was heard of the earwig until 1915, when it attracted much attention in Seattle, Washington, by its numbers and disagreeable habits. Afterwards, letters from both Portland and Albany, Oregon, began to call attention to the pest. By 1919 it had become established in Vancouver and New Westminster in British Columbia. In 1923 the earwig was known to occur in the following localities: Astoria, Salem, Eugene, Corvallis, Forest Grove, Gresham, Roseburg, Dayton, Mill City, Cotton and Blodgett, in Oregon; Vancouver, Camas and Anacortes, in Washington; and Berkeley, in California."

In British Columbia the earwig is now recorded from all over Vancouver, New Westminster and adjoining municipalities. It is also established on Vancouver Island in the district of Victoria, and I have seen specimens from as far north as Alert Bay on the northeast coast of Vancouver Island.

The following notes on the food habits of the European earwig are taken from a Circular by Gibson and Glendenning:<sup>37</sup> "The insect, especially active during the night, is an omnivorous feeder, eating both animal and vegetable food. Garden plants—vegetable and flowering—are attacked freely; beans, potatoes, peas, dahlias and roses, carnations, asters, etc., are noticeably injured. From New Westminster, B. C., we received one report of injury by the adults to apples on the tree. The fruit of other orchard trees is known to have been attacked."

"Since its introduction into the United States, the earwig has also become an important household pest, having been found in breadboxes, cakeboxes, hiding in head lettuce, crawling around in bedrooms and other portions of the house—in general becoming a decided nuisance. In Oregon the insect has established itself in certain residential sections to such an extent as to seriously affect the value of the property."

The seriousness of the earwig pest in the Pacific Coast cities has called for drastic measures by the authorities, and poisoning campaigns have been carried on in Portland, Oregon; Seattle, Washington, and in Vancouver, British Columbia. Very good results have been obtained where systematic and thorough work has been done by the poisoning crews. The poison bait most generally used has been made of the following ingredients: Sodium fluoride, 12 ounces; molasses, 2 quarts; wheat bran, 12 pounds; water, 6 quarts; the addition of 2½ lbs. of beef scrap is said to add to the attractiveness of this bait.

The life history of the European earwig is very similar to that of other species. The females lay from 40 to 60 oval cream-coloured eggs

<sup>37</sup>Gibson and Glendenning. Circ. 24. Dom. Ent. Br. Ottawa. 1925.

in small cells in the soil beneath boards or rubbish, and stay on guard over the eggs and newly hatched young.

Although this earwig has well developed wings it is very rarely known to fly.

In Europe the larvae of two species of flies (Tachinidae) live as internal parasites in the body of the earwigs, and are fatal to it. The Rothamsted Experiment Station in England has been exporting these parasites, **Digonochaeta setipennis** Fall and **Rhacodineura antiqua** Mg., to New Zealand, and more recently to the United States and to the Dominion Entomological Branch in Canada for liberation in the infested coast cities of Vancouver and New Westminster.

The five earwigs dealt with in this paper are the only species which have so far been recorded from Canada. Of these, **Doru aculeatum** (Scudder) is the only species which can be considered as a true native of the Dominion, and it will probably be found only in extreme southern Ontario.

The Little earwig, **Labia minor** (Linnaeus) has probably long been established in Canada from the Atlantic to the Pacific. It is a Palearctic species, but whether it entered America in historic or geologic times is not definitely known, although it is generally supposed that it was introduced accidentally by man.

The other three species, **Anisolabis maritima** (Géné), **Euborellia annulipes** (Lucas) and **Forficula auricularia** Linnaeus, are cosmopolitan species which have been introduced into Canada by commerce and which have become established in restricted areas on the coast of British Columbia. The European earwig, **Forficula auricularia** Linnaeus is the only species which is likely to become a serious economic pest in Canada, and probably only in the most humid coastal sections.



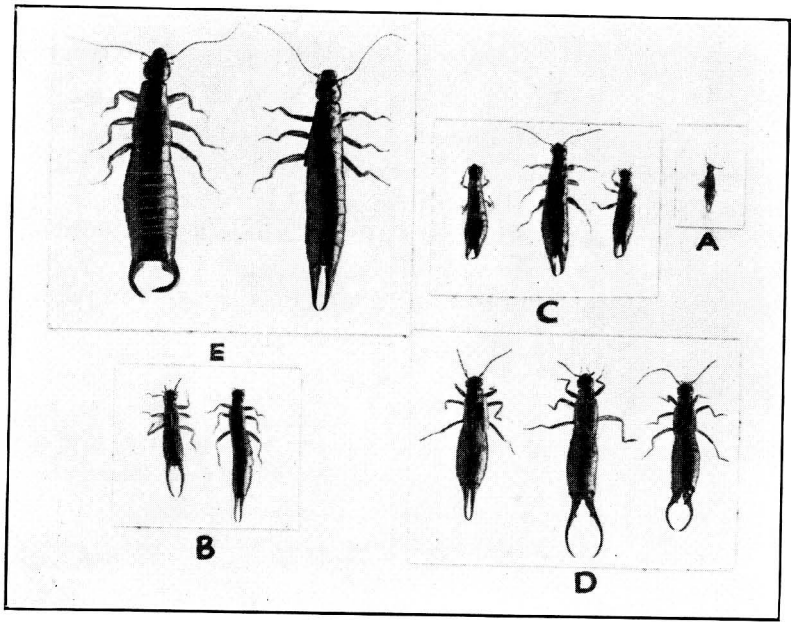


Fig. 1. Canadian Earwigs. Nat. size. (Original).

- a. *Labia minor* (Linnaeus). b. *Doru aculeatum* (Scudder). c. *Euborellia annulipes* (Lucas). d. *Forficula auricularia* Linnaeus. e. *Anisolabis maritima* (Géné).

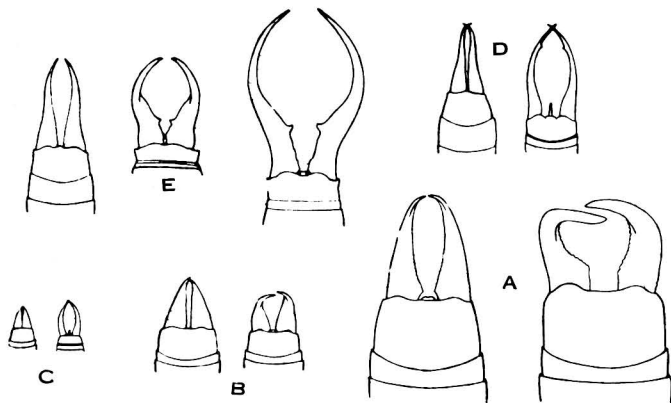


Fig. 2. Forceps of Canadian Earwigs. (Drawn by A. D. Heriot.)

- a. *Anisolabis maritima*. b. *Euborellia annulipes*. c. *Labia minor*. d. *Doru aculeatum*. e. *Forficula auricularia*.



**KEY TO SPECIES OF CANADIAN DERMAPTERA****Adults Only**

(See Plate 1, Figs. 1 and 2)

- A. Without trace of tegmina or wings.
- B. Legs yellowish, not banded with black; antennae 20-24 jointed. Large species, 20-28 mm. in length.

Maritime Earwig, *ANISOLABIS MARITIMA*

- BB. Legs yellowish, usually distinctly banded with black on femur and tibia; antennae 15-16 jointed. Medium size, 12-16 mm. in length.

Ring-legged Earwig, *EUBORELLIA ANNULIPES*

- AA. Tegmina, or tegmina and wings present.
  - C. Size small, tegmina and wings well developed, body clothed with fine yellowish pubescence. Antennae 12 jointed. Small, 5-7 mm. in length.

Little Earwig, *LABIA MINOR*

- CC. Size medium.
  - D. Slim species, tegmina well developed, wings usually abortive. Male with conspicuous pygidial spine; forceps slender, rather straight with (male) a tooth near apex. Length 11-17 mm.

Spine-tailed Earwig, *DORU ACULEATUM*

- DD. Stout species, tegmina and wings well developed. Male without pygidial spine; forceps stout, of male dimorphic; calliper-like. Length 16-23 mm.

European Earwig, *FORFICULA AURICULARIA*

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