EARWIG WING UNFOLDING

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European Earwigs (*Forficula auricularia*) are a pest on our garden plants usually by eating the young terminal shoots and leaves.

They are sexually dimorphic with the males having a pair of pincers at the rear end (Fig. 1) which can inflict a painful 'pinch' to one's hands.

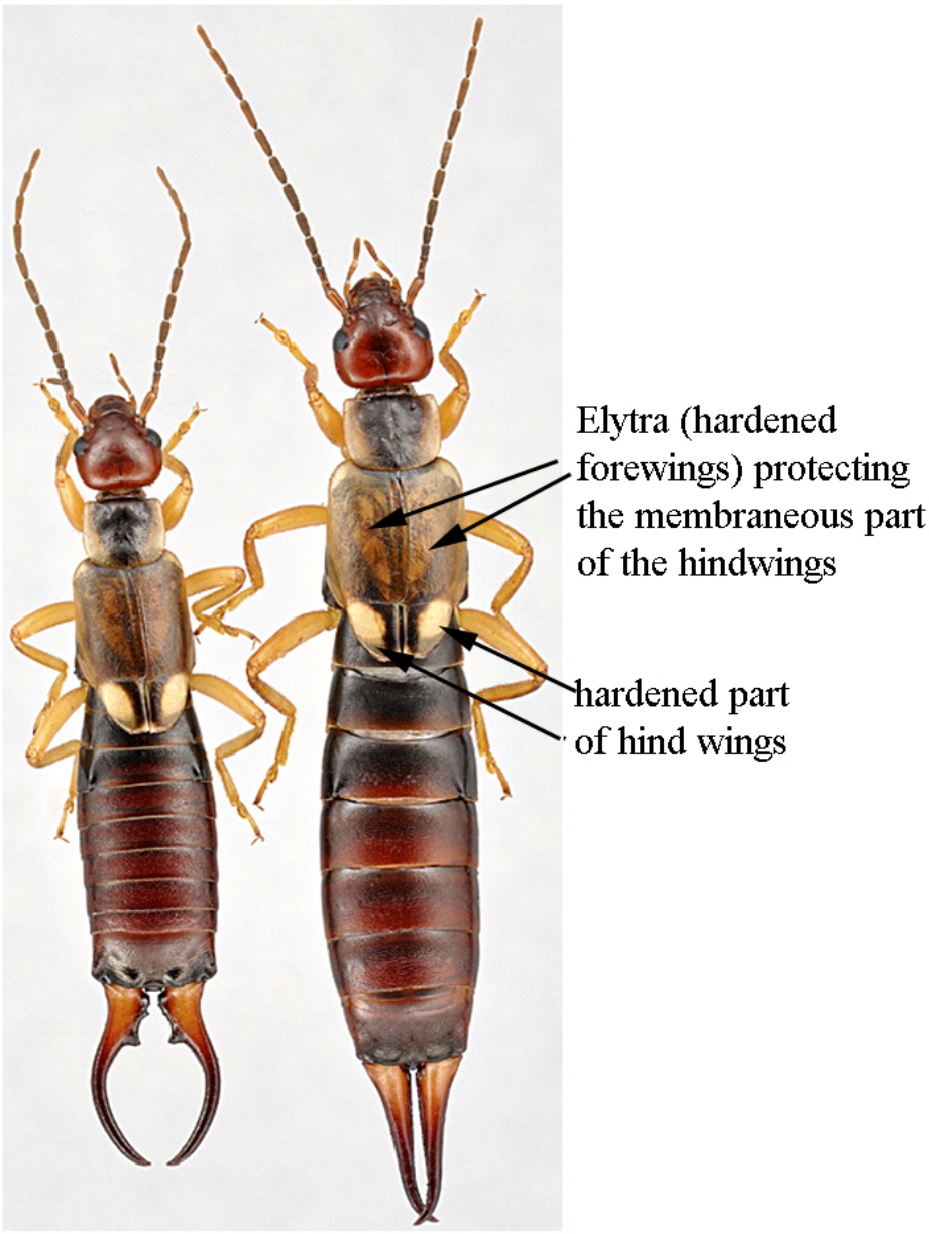

Fig. 1. Male (left) and female European Earwigs

Earwigs are winged insects but unlike most other insects the wings are not obvious. The hind wings are actually quite large but are ‘stored’ in a complex folding pattern under the small hardened forewings (elytra) (Fig. 1).

Figure 2 shows a female thorax with the elytra removed, showing the membranous portion of the hindwings along with the hardened portions.

Fig. 2. Thorax of a female with the elytra removed

To unfold the right hindwing I pulled out the lower part of the membranous wing (LW) from the hardened anterior part (Fig. 3). This results in a 3-dimensional wing, looks like an inverted V when viewed from the front with a fold line at the top of the inversion.

Fig. 3. Right hindwing after the lower membranous portion (LW) was pulled out from under the hardened anterior portion; H is a hinge that is needed for further unfolding

Moving the upper part of the wing at a right angle to the thorax causes the wing to rotate ventrally, the lower part of the wing now becomes the major part of the dorsal surface. There is another pleated membrane beneath the LW and it unfolds from a ventral hinge H. The ventral part A rotates outward at the point where the pin is holding the wing at a right angle to the thorax (Fig. 4). When A rotates outward the upper part of the wing that had rotated ventrally now rotates back dorsally and the hinge, H, is now halfway between A and B & C.

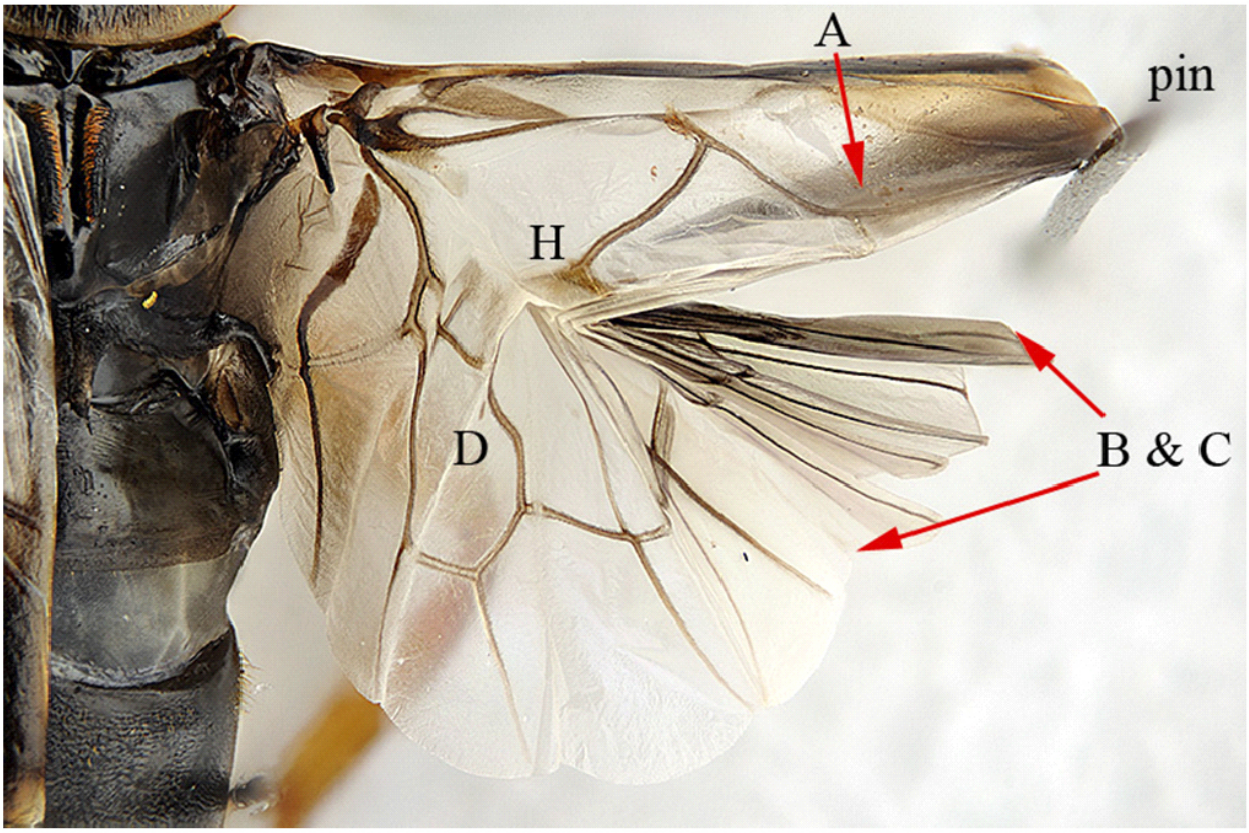

Fig. 4. Partly unfolded right hindwing. Pin holds the wing at a right angle to the thorax; H is the hinge; B, C, and D are reference points for Figs. 5 & 6.

When the upper part of the wing, near the pin in Fig. 4, rotates further the pleated wing membrane (B & C) becomes greatly expanded (Fig. 5). The lower part of the membrane below the dotted red line is lying flat and all the parts above the line are almost vertical.

A little bit more rotation results in more membrane unfolding at point C (Fig. 6)

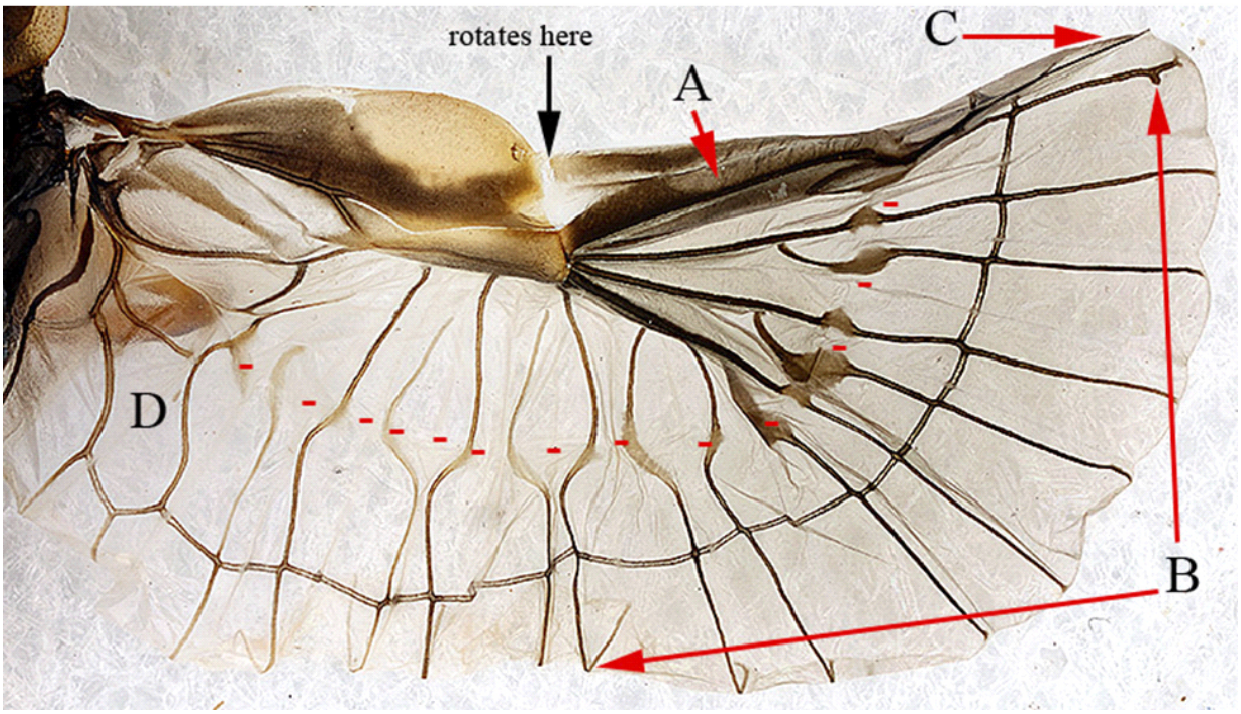

Fig. 5. Almost fully expanded right hind wing

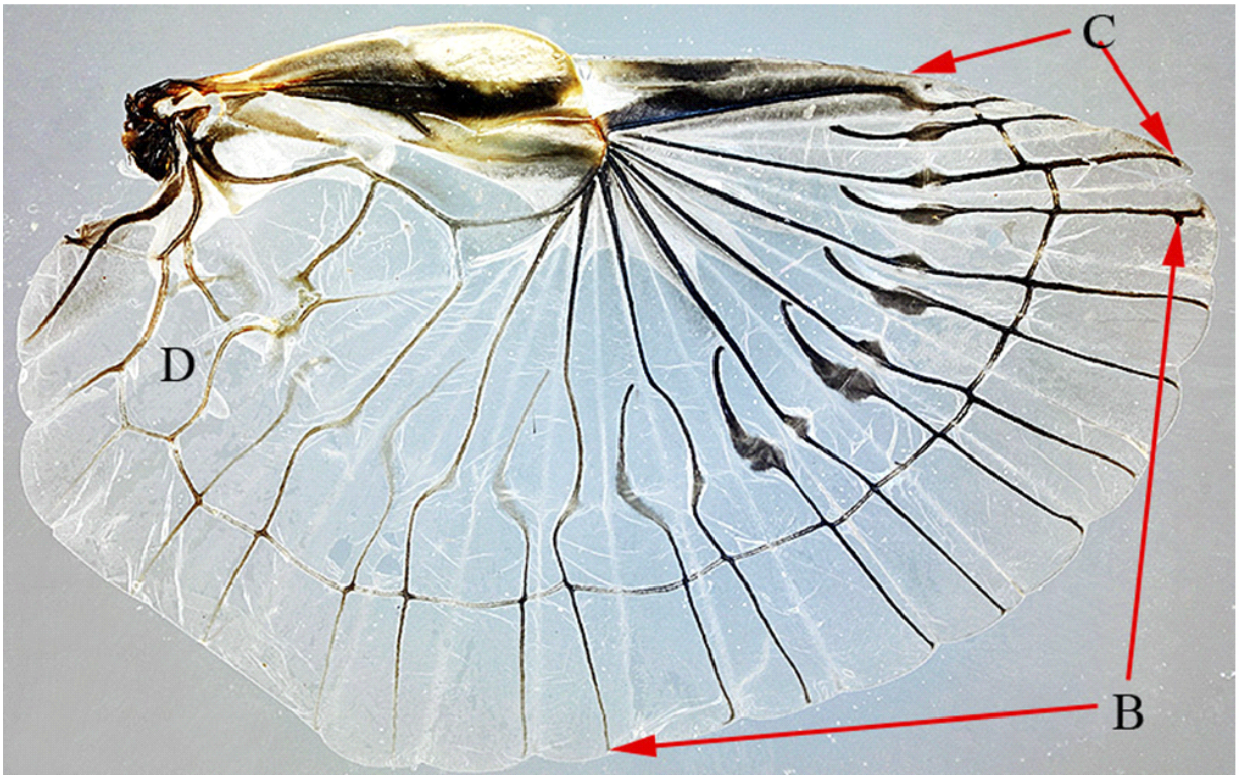

Fig. 6. Fully expanded right hindwing

Earwigs must be some sort of contortionists to unfold their wings, and some sort of packing expert to fold them up.

There is an image of a live male with its right hindwing expanded on BugGuide:

https://bugguide.net/node/view/1426057

Modified from an original article in Photomacrography.net, September 28 2009.

Comments to the author welcome, email – mothman AT nbnet DOT nb DOT ca.

Published in the November 2020 issue of *Micscape* magazine.

www.micscape.org