

## Supplementary file SM1: Systematic of Scolebythidae' matrix:

### Characters

1. Forewing marginal cell: apex on margin of wing (0); apex curving away from margin of wing (1); open, Rs present as a short stub (2); open, Rs long, terminating near wing margin (3).
2. First submarginal cell: short (0); elongate (1); open (2).
3. Clypeal apex: short (0); produced (1).
4. Frontal prominence: absent (0); present (1).
5. Facial depression: flat lateral to antennal toruli (0); depressed lateral to antennal toruli (1).
6. Ocellar triangle: equilateral (0); obtuse (1).
7. Occipital carina: present (0); absent (1).
8. Malar space: very short (0); one-third basal mandibular width (1); one-half or more basal mandibular width (2).
9. Pronotal collar: present (0); absent (1).
10. Notauli: present (0); reduced posteriorly (1); not apparent (2).
11. Metapostnotum: distinct (0); partially obliterated (1); not apparent (2).
12. Mesotibial spurs: two (0); one (1); none (2)a.
13. Metatibial spurs: two (0); one (1); none (2)a.
14. Female sixth sternum: simple (0); with polished area and setae (1).
15. Forewing Rs, apical portion: tubular (0); nebulous (1).
16. Forewing 1m-cu: tubular (0); nebulous or absent (1).
17. Forewing basal part Rs+M: tubular (0); nebulous (1).
18. Forewing Cu distad 1m-cu: tubular (0); nebulous or absent (1).
19. Forewing Cu basad 1m-cu: tubular (0); partly nebulous (1).
20. Median ocellus: aligned or anterior to upper tangent of compound eyes (0); well posterior to upper tangent of compound eyes (1).
21. Parapsidal lines: present (0); absent (1).
22. Metafemur: not flattened (0); flattened (1).
23. Mesoscutellum: separated from mesoscutum by transverse furrow (0); separated from mesoscutum by pair of segregated pits (1).
24. Forewing R1: present (0); absent or vestigial at best (1).
25. Prosternum unmodified (0); expanded into a large diamond shape and pushing procoxae and posterior corners of propleura apart (1), coded as absent in Plumariidae (Nagy, 1973; Brothers, 1974, 1983; Day, 1977; Roig-Alsina, 1994; Papp, 2000; Pentead-Dias and Scatolini, 2003; Diez et al., 2007, 2012; Diez and Roig-Alsina, 2008; Diez, 2008), and present for all living and fossil scolebythids;
26. Pronotum short (0); long (1), as measured in relation to the mesoscutal length;
27. Pronotal anterior border declivitous (0); not declivitous (1).

28. Margin of pterostigma inside marginal cell straight (0); convex (1). (**New character**)

Matrix

Plumariidae	00(01)0000(01)(01)(12)0000000000(01)0000000
<i>Boreobythus turonius</i>	30100?1202???00011010001100
<i>Clystopenella longiventris</i>	1000111210100100010101101001
<i>Clystopenella mirabilis</i>	1000111210100100010101101000
<i>Eobythus patriciae</i>	2200001212222?1?100111011001
<i>Libanobythus milkii</i>	3000000?02?11?00010010011111
<i>Pristapenesia asiatica</i>	2211000212211?11111010011000
<i>Pristapenesia inopinata</i>	2211000211211?11111000011000
<i>Pristapenesia primaeva</i>	2211000212211?11111010011001
<i>Pristapenesia stricta</i>	2211000212211?11111010011001
<i>Scolebythus madecassus</i>	0010110110100000010000101000
<i>Ycaploca evansi</i>	1111000010011000010000001000
<i>Ycaploca fijianus</i>	1111100010011000010000001001
<i>Zapenesia libanica</i>	3200101210000001111110011011
<i>Uliobythus terpsichore</i>	3200001210?11?01111100011011
<i>Necrobythus pulcher</i>	3200001212011?01111010011010
<i>Sphakelobythus limnopous</i>	3200001210011?01111010011011
<i>Ectenobythus iberiensis</i>	3200001200011?01111000011110