

Two new species of *Zeuxevania* Kieffer (Hymenoptera: Evaniidae) from China with a key to species

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Abstract: Two new species of *Zeuxevania* Kieffer, 1902 from China (Yunnan) are described and illustrated: *Z. achlys* Chen, Liu & Li **sp. nov.** and *Z. brevipetiolata* Chen, Liu & Li **sp. nov.** A key to the species of *Zeuxevania* from China is provided.

Key words: Ichneumonoidea; ensign wasps; taxonomy

中国接合旗腹蜂属二新种及分种检索表（膜翅目：旗腹蜂科）

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摘要：记述中国接合旗腹蜂属2新种：黑底接合旗腹蜂 *Zeuxevania achlys* Chen, Liu & Li **sp. nov.** 和短柄接合旗腹蜂 *Zeuxevania brevipetiolata* Chen, Liu & Li **sp. nov.**。编制了中国接合旗腹蜂属分种检索表。

关键词：姬蜂总科；旗腹蜂；分类

Introduction

Zeuxevania Kieffer, 1902 is a small and rare genus of Evaniidae (Hymenoptera) with 36 valid described species reported in Afrotropical (20 spp.) and Oriental Regions (13 spp.) (Li & Xu 2017; Sharanowski *et al.* 2019; Kazmi & Rameshkumar 2021; Deans *et al.* 2022). Based on a multi-gene phylogeny using six molecular markers, *Papatuka* and *Parevania* were treated as junior synonyms of *Zeuxevania* (Sharanowski *et al.* 2019). Prior to this paper, three species of *Zeuxevania* had been recorded from China (He 2004; Li & Xu 2017). Here two new species are discovered and described from China (Yunnan).

Material and methods

Specimens were examined and described using a Motic SMZ-168 stereomicroscope. All photos were taken with a digital camera Cool SNAP attached to the Zeiss Stemi 2000-cs stereomicroscope and processed using Image-Pro Plus software. Figures were finished with Photoshop CC 2015.0.0, mostly to adjust the size and background.

Terminology of wing venation follows Deans & Huben (2003). Other morphological

Accepted 15 December 2022. Published online 27 February 2023. Published 25 March 2023.

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terms follow the Hymenoptera Anatomy Ontology Portal (HAO Portal) (Yoder *et al.* 2010). Measurements in descriptions are relative, except for body length and fore wing length that are reported in millimeters.

Abbreviations used in the text are: POL — the shortest distance between posterior ocelli; OOL — the shortest distance between posterior ocellus and compound eye; OD — the diameter of ocellus.

The holotypes of new species are deposited in the Hymenoptera Collection of Hunan University of Humanities, Science and Technology, Loudi (HUHST) and in South China Agricultural University, Guangzhou (SCAU).

Taxonomy

Genus *Zeuxevania* Kieffer, 1902

Zeuxevania Kieffer, 1902: 4.

Zeuxevania Kieffer: Kieffer 1911: 155; Kieffer 1912: 54; Deans & Huben 2003: 863; Deans 2005: 107. Li & Xu 2017: 129; Kazmi & Rameshkumar 2021: 1.

Papatuka Deans: Deans 2002: 2; Deans & Huben 2003: 862; Sharanowski *et al.* 2019.

Parevania Kieffer: Kieffer 1907: 207; Deans & Huben 2003: 864; Sharanowski *et al.* 2019.

Diagnosis. Antenna 13-segmented; wing present or absent, if apterous, antlike in appearance with relatively small eye (Deans 2002); if wing present, fore wing with six closed cells, vein 1RS missing, fusing basal and 1st submarginal cells (Kieffer 1902), or fore wing with seven closed cells, fore wing 1RS usually attached to Sc+R basal to the stigma and curved toward wing base (Kieffer 1907); distance between mid and hind coxae 0.6× or less distance between fore and mid coxae.

Biology. Egg parasitoids of *Apotrogia* spp., *Blattella* spp., and *Loboptera* sp. (Blattodea) (Deans 2005).

Chinese known species included. *Zeuxevania laeviceps* (Enderlein, 1913), *Zeuxevania kriegeriana* (Enderlein, 1905), *Zeuxevania orientalis* Li & Xu, 2017.

Distribution. Oriental Region: China (Zhejiang, Fujian, Guangdong, Guangxi, Guizhou, Yunnan, Taiwan); India; Philippines (He 2004; Deans 2005; Li & Xu 2017; Kazmi & Rameshkumar 2021). Afrotropical Region: Congo; Madagascar; Mozambique; Tanzania (Deans 2005; Deans *et al.* 2022); Palearctic Region: Croatia; Egypt; France; Greece; Italy; Tunisia (Deans 2005; Deans *et al.* 2022).

Key to species of genus *Zeuxevania* from China

1. Fore wing with seven closed cells, 1RS present 2
- Fore wing with six closed cells, 1RS missing 4
2. Head and petiole with dense and fine punctures 3
- Head and petiole smooth without punctures *Z. laeviceps* (Enderlein)
3. Mesosoma reddish orange fully; subapical tooth distinctly more prominent than apical one
..... *Z. kriegeriana* (Enderlein)
- Mesosoma reddish orange with black ventrally; apical tooth distinctly more prominent than subapical one.
..... *Z. achlys* Chen, Liu & Li **sp. nov.**
4. Head wholly black; petiole short, 0.8× as long as distance of petiole from metanotum
..... *Z. brevipetiolata* Chen, Liu & Li **sp. nov.**

-. Head mostly black, with face and lower part of gena yellowish brown to brown; petiole long, 3.2× as long as distance of petiole from metanotum..... *Z. orientalis* Li & Xu

1. *Zeuxevania achlys* Chen, Liu & Li sp. nov. (Figs 1, 2)

Description. Holotype female. Body length 6.2 mm; fore wing length 4.9 mm. Head black. Mandible brown to yellowish brown, with black teeth. Maxillary and labial palpi yellowish brown. Antenna black, with antennal segments 1–3 yellowish brown. Mesosoma reddish orange with black ventrally. Fore and mid legs yellowish brown to blackish brown. Hind coxa and trochanter mostly yellowish white, hind femur black with apical 1/3 part yellowish white, hind tibia and tarsus blackish brown. Petiole basal half black and apical half yellowish white. Metasoma black.

Head. Head fully pubescent. Vertex densely and finely punctate. Frons flat, densely and finely punctate. Antennal toruli clearly separated. Face slightly convex; densely and finely punctate; face with a small tubercle medially, and with a carina from eye to basal mandible. Clypeus triangle, strongly protruded medially. Gena densely and finely punctate. Malar space length 0.5× as long as basal width of mandible, 0.1× as long as eye height. Antennal scape 5.7× as long as wide; pedicel 1.4× as long as wide; antennal segments in following proportions: 51 : 10 : 27 : 18 : 15 : 15 : 15 : 15 : 15 : 11 : 12 : 19. Eye 0.6× as wide as high at widest point. Mandible with four teeth, apical tooth not obvious. OOL : POL : OD = 8 : 13 : 7. The distance between lateral ocellus and occipital carina 1.6× as long as OD. Occipital carina complete.

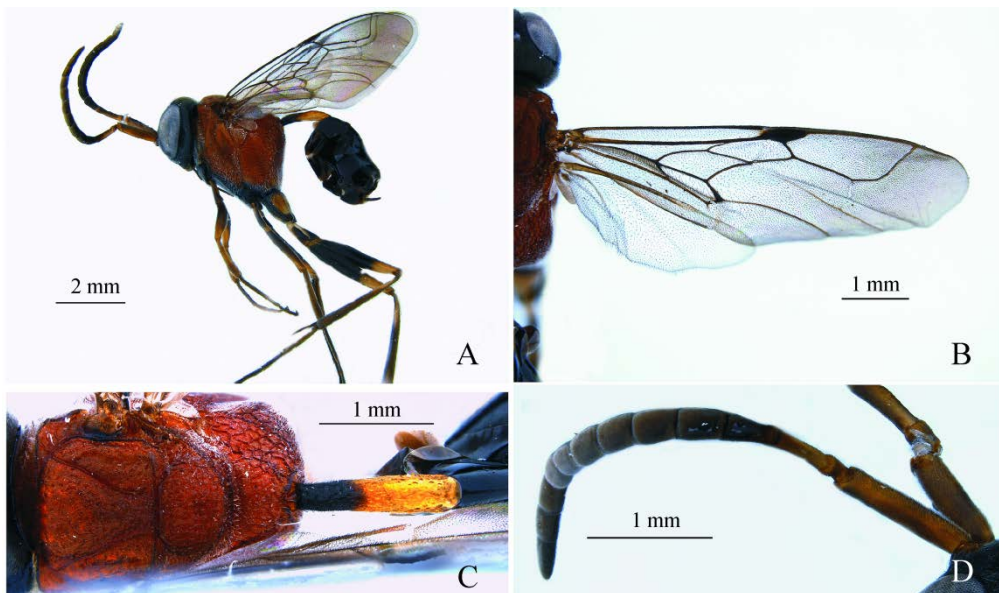


Figure 1. *Zeuxevania achlys* Chen, Liu & Li sp. nov., holotype, ♀. A. Habitus, lateral view; B. Wings; C. Mesosoma and petiole, dorsal view; D. Antennae.

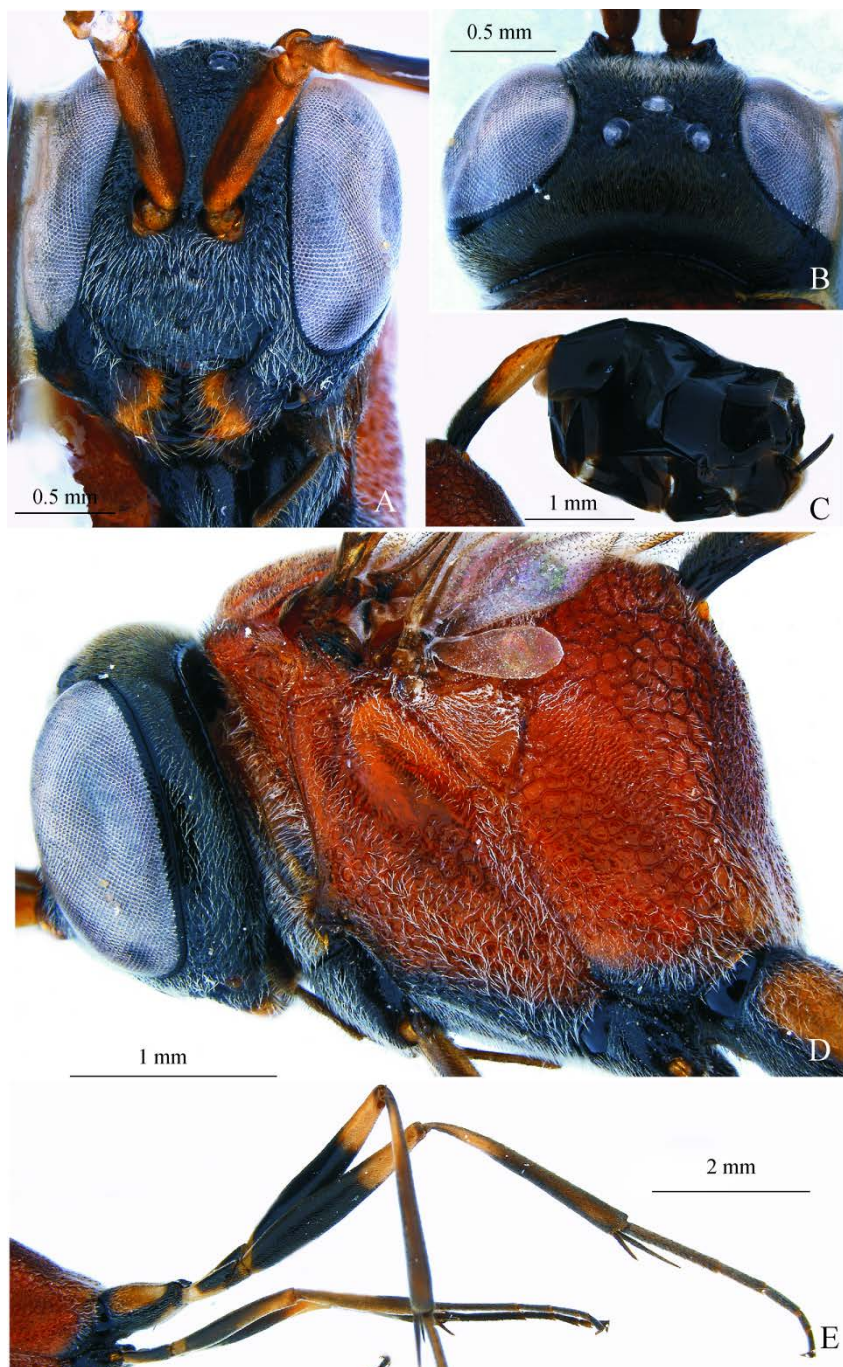


Figure 2. *Zeuxevania achlys* Chen, Liu & Li **sp. nov.**, holotype, ♀. A. Head, front view; B. Head, dorsal view; C. Metasoma, lateral view; D. Head and mesosoma, lateral view; E. Hind legs.

Mesosoma. Mesosoma finely and densely punctate dorsally, as long as high in lateral view. Pronotum invisible medially, lateral angle rounded. Mesoscutum 0.8× as long as wide. Notaulus slightly curved and nearly parallel apically. Parapsidal furrow present.

Mesoscutellum 0.7× as long as mesoscutum; flat medially, strongly depressed antero-laterally. Mesopleuron densely and finely punctate, and with several transverse carinae dorso-laterally, slightly depressed medially, speculum small, reticulate-rugose ventro-laterally. Metapleuron densely punctate dorso-laterally, and reticulate-rugose ventro-laterally. Propodeum reticulate-rugose, flat posteriorly. Hind leg 4.4× as long as mesosoma height. Hind coxa densely and finely punctate; hind femur 1.0× as long as hind tibia; hind tibia and first tarsomere with small spines; hind tibia 0.9× as long as hind tarsus; hind inner tibial spur 1.8× as long as outer spur, 0.7× as long as first tarsomere of hind tarsus; first tarsomere of hind tarsus 0.8× as long as hind tarsomeres 2–5 combined; tarsal claw bidentate, apical teeth distinctly more prominent than subapical one. Fore wing with seven closed cells, vein 1RS attached to Sc+R basal to the stigma and curved toward wing base. Hind wing with seven hamuli.

Metasoma. Petiole pubescent basally, dense and fine punctures; 1.4× as wide as high; 4.4× as long as wide; 2.6× as long as distance of petiole from metanotum. Metasoma smooth with pubescent basally, elliptical in lateral view.

Male. Unknown.

Variation. Body length 6.0 mm; fore wing length 4.7 mm. Petiole mostly yellow, with black basal-dorsally.

Biology. Unknown.

Holotype. ♀, **China**, Yunnan, Xishuangbanna, Jinghong, Nabanhe National Nature Reserve, 19–23-VII-2011, Hebojing LIU, 2016000343 (SCAU). **Paratype.** 1♀, locality, collection date and collector as holotype, 2016000341 (SCAU).

Etymology. The specific epithet is from the Greek “*achlys*” and refers to mesosoma being black ventrally.

Remarks. This new species can be distinguished from other species of genus *Zeuxevania* by: (1) mesosoma reddish-orange dorsally and laterally, black ventrally; (2) fore wing with seven closed cells; (3) apical teeth of hind tarsal claw more prominent than subapical one.

2. *Zeuxevania brevipetiolata* Chen, Liu & Li sp. nov. (Fig. 3)

Description. Holotype male. Body length 7.7 mm; fore wing length 6.8 mm. Head black. Mandible yellowish white with teeth brown. Maxillary and labial palpi yellowish brown. Antenna blackish brown, with segments 1–5 ventral yellowish brown. Mesosoma black. Fore leg brown to blackish brown. Mid leg black. Hind leg black, with hind tibia basal 1/3 yellowish brown. Petiole black. Metasoma black. Wings hyaline; veins blackish brown.

Head. Head fully pubescent, its height 1.1× as long as width. Vertex smooth. Frons flat and smooth. Antennal toruli clearly separated. Face slightly convex, densely and finely punctate, lower face with a small tubercle medially. Median apex of clypeus moderately protruding. Gena smooth. Malar space length 2.0× as long as basal width of mandible, 0.7× as long as eye height. Eye 0.7× as wide as high at widest point. Antennal scape 1.9× as long as wide; pedicel 0.7× as long as wide; antennal segments in following proportions: 31 : 8 : 77 : 74 : 72 : 56 : 49 : 48 : 44 : 38 : 34 : 33 : 40. Mandible with three teeth, apical tooth longer and sharper than other two. OOL : POL : OD = 11 : 9 : 5. The distance between lateral ocellus and occipital carina 3.0× as long as OD. Occipital carina complete.

Mesosoma. Mesosoma fully pubescent, 1.2× as long as high in lateral view. Pronotum narrow medially, lateral angle rounded, enlarged and exceeding tegula laterally, densely and

finely punctate. Mesoscutum sparsely and finely punctate; $1.4\times$ as long as wide; slightly convex medially and flat laterally. Notaulus complete, straight. Parapsidal furrow present. Mesoscutellum sparsely and finely punctate; $0.7\times$ as long as mesoscutum; slightly convex medially, slightly depressed anterior-laterally. Metanotum irregularly foveolate. Mesopleuron densely and finely punctate dorsally, flat medially, speculum small and smooth, densely and finely punctate. Metapleuron reticulate-rugose. Propodeum densely and finely punctate dorsally, flat posteriorly. Hind leg $4.4\times$ as long as mesosoma height. Hind coxa densely and finely punctate; hind femur $0.7\times$ as long as hind tibia; hind tibia and first tarsomere without small spine; hind tibia $1.0\times$ as long as hind tarsus; hind inner tibial spur $1.8\times$ as long as outer spur, $0.5\times$ as long as first tarsomere of hind tarsus; tarsomere 1 of hind tarsus $1.1\times$ as long as hind tarsomeres 2–5 combined; tarsal claw bidentate, subapical tooth more prominent than apical one. Fore wing with six closed cells, vein 1RS missing, fusing basal and 1st submarginal cells. Hind wing with nine hamuli.

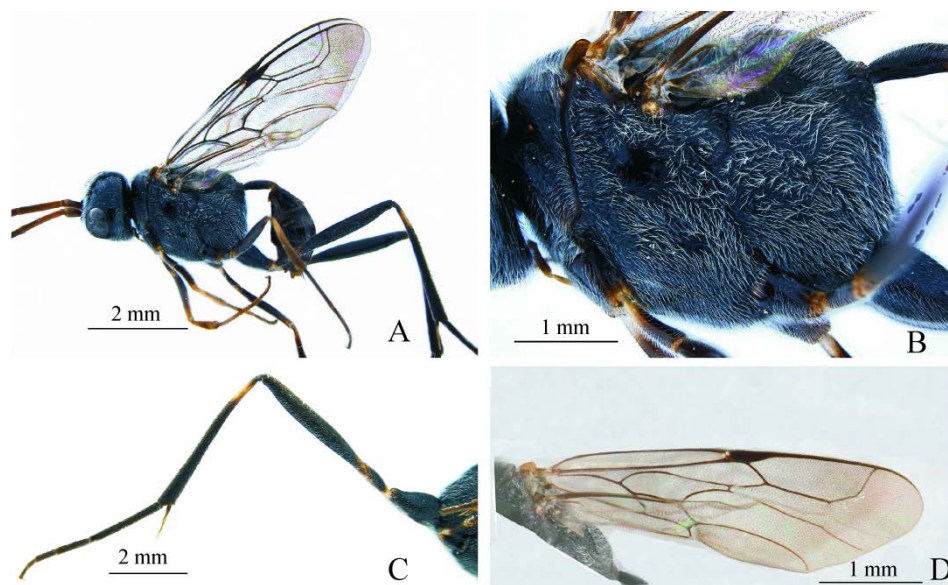


Figure 3. *Zeuxevania brevipetiolata* Chen, Liu & Li **sp. nov.**, holotype, ♂. A. Habitus, lateral view; B. Metasoma, lateral view; C. Hind legs; D. Wings.

Metasoma. Petiole fully pubescent, finely and sparsely punctate, bent and short, $1.1\times$ as wide as high, $3.0\times$ as long as wide, $0.8\times$ as long as distance of petiole from metanotum. Metasoma fully pubescent and finely punctate; elliptical in lateral view.

Female. Unknown.

Variation. Paratype, male, body length 7.5 mm; fore wing length 6.8 mm, hind wing with eight hamuli.

Biology. Unknown.

Holotype. ♂, **China**, Yunnan, Xishuangbanna, Jinghong, 31-VII-2003, Zaifu XU, 2016000883 (SCAU). **Paratype.** 1♂, **China**, Yunnan, Xishuangbanna Botanical Garden, rubber forest, 543 m, $21^{\circ}9'12.439''N$ $101^{\circ}26.84'E$, 31-V-03-VII-2019, Li MA, collected by Malaise trap, 2022000001(HUHST).

Etymology. The specific epithet “*brevipetiolata*” is a combination of Latin words

“*brevis*” and “*petiolus*”, which refers to this new species having a short petiole.

Remarks. This new species can be distinguished from other species of the genus *Zeuxevania* by: (1) head and mesosoma black; (2) fore wing with six closed cells; and (3) petiole 0.8× as long as distance of petiole from metanotum.

Acknowledgements

We very much appreciate professor Meicai WEI and John Richard SCHROCK for their valuable comments and suggestions to improve the manuscript. We are very thankful to Li MA (Department of Entomology, College of Plant Protection, Yunnan Agricultural University, Kunming), Jingxian LIU (Department of Entomology, College of Plant Protection, South China Agricultural University, Guangzhou) and Huayan CHEN (South China Botanical Garden, Guangzhou) for the material provided for this study. This research was partly supported by doctoral research start-up funding of HUHST (051-82500212).

References

- Deans AR & Huben M. 2003. Annotated key to the ensign wasp (Hymenoptera: Evaniidae) genera of the world, with descriptions of three new genera. *Proceedings of the Entomological Society of Washington*, 105(4): 859–875.
- Deans AR. 2002. *Papatuka alamunyiiga* Deans, a new genus and species of apterous ensign wasp (Hymenoptera: Evaniidae) from Kenya. *Zootaxa*, 95: 1–8.
- Deans AR. 2005. Annotated catalog of the world's ensign wasp species (Hymenoptera: Evaniidae). *Contributions of the American Entomological Institute*, 34(1): 1–164.
- Deans AR, Yoder, MJ & Dole K. 2022. Evanioidea Online—catalog of information about evanioid wasps (Hymenoptera). Available from: <http://evanioidea.info>. (Accessed 16 April 2022)
- He JH. 2004. Evaniinoidea. In: He JH, Chen XX, Fan JJ, Li Q, Liu CM, Lou XM, Ma Y, Wang SF, Wu YR, Xu ZH, Xu ZF & Yao J (Eds), *Hymenopteran insect fauna of Zhejiang*. Science Press, Beijing, pp. 76–86.
- Kazmi SI & Rameshkumar A. 2021. Description of a new species of *Zeuxevania* Kieffer (Hymenoptera: Evaniidae) from India with a key to species. *Biodiversity Data Journal* 9: e59487. <https://doi.org/10.3897/BDJ.9.e59487>.
- Kieffer JJ. 1902. *Zeuxevania* Kieffer. In: Wytzman P (Ed.), *Genera Insectorum 2. Vol. 2, Hymenoptera fam. Evaniidae*. L. Desmet-Verteneuil, Brussels, Belgium, pp. 1–13+1 plate.
- Kieffer JJ. 1907. Beschreibung neuer im Naturhistorischen Museum zu Hamburg aufbewahrter Proctotrypiden und Evaniiden. *Berliner Entomologische Zeitschrift*, 51: 258–278.
- Kieffer JJ. 1911. Étude sur les évaniides exotiques (Hym.). *Annales de la Société Entomologique de France*, 80: 151–231.
- Kieffer JJ. 1912. *Evaniidae*. Das Tierreich, Berlin, 431 pp.
- Li YC & Xu ZF. 2017. First record of the genus *Zeuxevania* Kieffer, 1902 from Oriental Region (Hymenoptera: Evaniidae). *Zootaxa*, 4286(1): 129–133.
- Sharanowski BJ, Peixoto L, Molin DA & Deans AR. 2019. Multi-gene phylogeny and divergence estimations for Evaniidae (Hymenoptera). *PeerJ*, 7: e6689.
- Yoder MJ, Mikó I, Seltmann KC, Bertone MA & Deans AR. 2010. A gross anatomy ontology for Hymenoptera. *PLoS ONE*, 5(12): e15991.