

THE *OBSELETUS* GROUP OF GENUS *EXALLONYX* (HYMENOPTERA: PROCTOTRUPIDAE) FROM CHINA¹

Jingxian Liu,² Junhua He,³ and Zaifu Xu²

ABSTRACT: This paper describes three new species in the *obseletus*-group of genus *Exallonyx* Kieffer from China. These taxa are: *E. densirugulosus* sp. nov., *E. inconditus* sp. nov. and *E. laevipropodeum* sp. nov. All specimens are deposited in the Hymenopteran Collection of Zhejiang University, Hangzhou.

KEY WORDS: Hymenoptera, Proctotrupidae, *Exallonyx*, new species, China

Exallonyx Kieffer, 1904, is the largest genus in the Proctotrupinae, the largest subfamily of the Proctotrupidae. This genus is worldwide, with more than 160 species described. The genus *Exallonyx* includes two subgenera: *Eocodrus* and *Exallonyx*. In the subgenus *Exallonyx* Kieffer, 1904, Townes and Townes (1981) divided all species into eleven species groups. The *obseletus* group is one of the species groups of the subgenus *Exallonyx*, of which six species are known: *E. crenicornis* Nees, 1834 from Europe, *E. obseletus* Say, 1836 from North America, *E. pallidistigma* Morley, 1911 from Eurasia, *E. grandis* Brues, 1919 from Eastern North America, *E. recavus* Townes and Townes, 1981 and *E. achilus* Townes and Townes, 1981 from Mexico (Townes and Townes, 1981). No species of this species group were known from China. Recently, however, we examined a lot of specimens of *Exallonyx* from China and recognized three new species. All of them belong to the *obseletus* group, and are described below.

Exallonyx densirugulosus Liu, He, and Xu, NEW SPECIES

(Figs. 1-8)

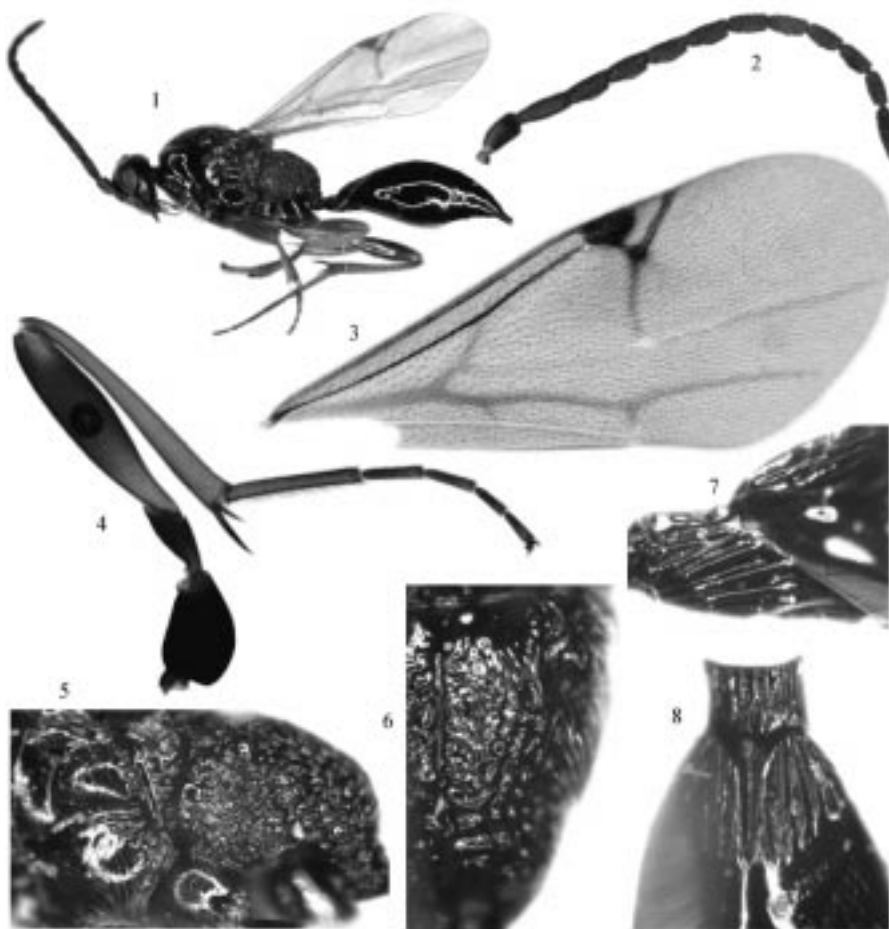
Diagnosis: Temple 1.1x as long as eye in dorsal view. Flagellar segments with tyloids. Lower corner of pronotum with one pit. Metapleuron nearly filled with dense reticulate wrinkles. Lateral side of abdominal stalk with two weak oblique transverse ridges. Claspers triangular, almost straight.

Description: Male. Front wing 3.5 mm long. Body black. Labrum blackish brown. Apical half of mandible reddish brown. Palpi fulvous. Tegula reddish brown. Antenna blackish brown. Legs reddish brown, except for blackish brown to black coxae and trochanters. Wings hyaline infusate. Stigma and strong veins black brown. Weak vein indistinct.

¹ Submitted on November 15, 2005. Accepted on December 11, 2005.

² Department of Entomology, South China Agricultural University, Guangzhou 510642, The People's Republic of China. E-mail: jxliu1979@yahoo.com.cn; xuzaiifu@scau.edu.cn.

³ Corresponding author. Department of Plant Protection, Zhejiang University, Hangzhou 310029, The People's Republic of China. E-mail: jhhe@zju.edu.cn.



Figs. 1-8. *Exallonyx densirugulosus* Liu, He and Xu, NEW SPECIES. 1. Habitus (lateral view). 2. Antenna. 3. Front wing. 4. Hind leg. 5. Posterior part of thorax (lateral view). 6. Left part of propodeum (dorsal view). 7. Abdominal stalk and basal syntergite (lateral view). 8. Abdominal stalk and basal syntergite (dorsal view).

Temple 1.1x as long as eye in dorsal view. Cheek 0.39x as long as longest diameter of eye, 0.6x as long as shortest diameter of eye. Clypeus 2.8x as wide as long, rather even, weakly convex; its apex weakly concave. Second flagellar segment 2.3x as long as wide. Tenth flagellar segment 2.5x as long as wide. Last segment 1.6x as long as penultimate segment. Flagellum with tyloids. Area between antennal sockets with a strong and high carina. Occipital carina of normal height.

Pronotum with 4-5 transverse carinae on collar. Epomia strong. Side of pronotum without hairs behind epomia and carina on collar. Upper edge of pronotum

with a haired band about 2 hairs wide. Lower corner of pronotum with one pit. Front edge of mesopleuron with a patch of hairs on upper corner and a patch of hairs above the horizontal groove, bare area between these two patches 1.3x as long as tegula. Speculum with sparse hairs on upper 0.65 of surface. Lower half of mesopleuron with sparse hairs, except along the horizontal groove hairless; posterior part of lower corner with parallel wrinkles. Mesopleuron nearly filled with dense reticulate wrinkles and moderately dense hairs. Upper margin of propodeum arcuate in lateral view. Upper face of propodeum with coarse reticulate wrinkles, except for a small smooth area at the base. Median ridge of propodeum incomplete, reaching to the middle of the hind face. Hind face with anterior half reticulately wrinkled and posterior half smooth. Lateral side of propodeum fully reticulate rugose. Hind femur 4.6x as long as deep. Longer spur 0.44x as long as hind basitarsus. Stigma 2.0x as long as wide, receiving radial vein at its middle. Costal part of radial cell 0.69x as long as depth of stigma, posterodistal side of stigma weakly convex. First radial vein oblique, 2.4x as long as wide. Second radial vein straight. Posterior margin of hind wing with a shallow notch at 0.35x wing length from the base.

Abdominal stalk 0.9x as long as wide in dorsal view, with seven parallel longitudinal ridges. Abdominal stalk 0.87x as long as deep in lateral view, with two weak transverse ridges at the base, followed by seven sloping longitudinal ridges. Base of syntergite with median groove reaching to 0.8x of space between the thylidia, each side of median groove with four shallow lateral grooves that become diffuse at apical part. Sublateral grooves as long as median groove. First thylidium 6.7x as wide as long, separated by 0.35x the width of one thylidium. Hairs on syntergite sparse, none of them close to lower edge of the syntergite. Clasper triangular, not curved, not sharp at tip.

Female: Unknown.

Type Material: Holotype, male, CHINA, Inner Mongol Autonomous Region, Mt. Daqingshan, 17.VIII.2000, Coll. Junhua He, No.200100286, deposited in the Hymenopteran Collection of Zhejiang University (ZU), Hangzhou. Paratype, 1 male, CHINA, Shaanxi Province: Mt. Qinling, 4.IX.1999. Coll. Ping Cai, No.200011717, deposited in ZU.

Distribution: China (Inner Mongol Autonomous Region and Shaanxi Province)

Etymology: This specific name is derived from the Latin adjective *densi* (dense) + *rugolus* (rugulose). It refers to the metapleuron of this species which is covered with reticulate wrinkles.

Remarks: This species is similar to *E. crenicornis* Nees, 1911, but differs from the latter by having the cheek 0.6x as long as shortest diameter of eye; tenth flagellar segment 2.5x as long as wide; upper edge of pronotum with a haired band about 2 hairs wide; metapleuron with dense reticulate wrinkles.

***Exallonyx inconditus* Liu, He, and Xu, NEW SPECIES**

(Figs. 9-15)

Diagnosis: Temple as long as eye in dorsal view. All flagellar segments with linear tyloids. Lower corner of pronotum with one pit. Metapleuron with irregular reticulate wrinkles and moderately dense hairs, almost without smooth area. Upper face of propodeum irregularly rugose, with a very small smooth area on base. Abdominal stalk without transverse ridge at its lateral side.

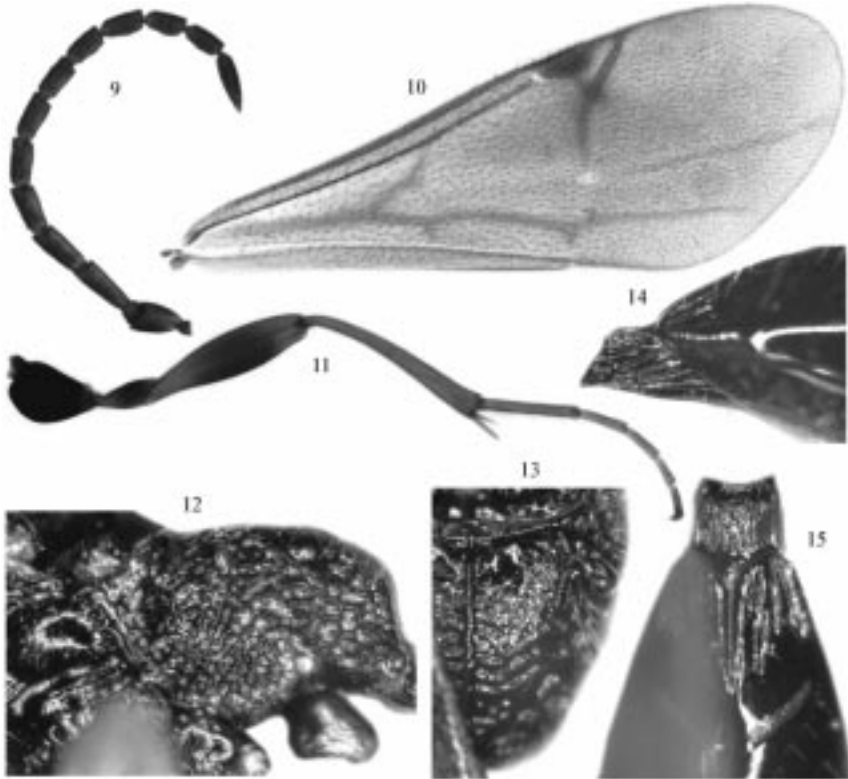
Description: Male. Front wing 3.6 mm long. Body black. Palpi yellow. Labrum, mandible and tegula reddish brown. Antenna blackish brown with fulvous tyloids. Legs fulvous, except for blackish brown to black coxae. Wings hyaline, weakly infusate. Stigma and strong veins dark fulvous. Weak vein yellow.

Temple as long as eye in dorsal view. Cheek 0.37x as long as longest diameter of eye, 0.67x as long as shortest diameter of eye. Clypeus 3.0x as wide as long, weakly evenly convex; its apex truncate. Second flagellar segment 2.1x as long as wide. Tenth flagellar segment 2.1x as long as wide. Last segment 1.6x as long as penultimate segment. Flagellum with linear tyloids. Area between antennal sockets with a moderately high carina. Occipital carina of normal height.

Pronotum with 4-5 transverse wrinkles on collar, convex in lateral view. Epomia strong. Side of pronotum without hairs behind epomia and carina on collar. Upper edge of pronotum with a haired band about 2 hairs wide. Lower corner of pronotum with one pit. Front edge of mesopleuron with a patch of hairs on upper corner and a patch of hairs above the horizontal groove, bare area between these two patches 1.2x as long as tegula. Speculum with sparse hairs on upper 0.6 of surface. Lower half of mesopleuron with sparse hairs, except for hairless zone along the horizontal groove; posterior part of lower corner with some parallel wrinkles. Metapleuron with irregular reticulate wrinkles and moderately dense hairs, almost without smooth area. Upper margin of propodeum arcuate in lateral view. Upper face of propodeum with irregular reticulate wrinkles except for a small smooth area on base, which is not reaching the propodeal spiracles. Median ridge of propodeum complete and reaching the lower edge of the hind face. Hind face of propodeum with transverse wrinkles on anterior third and smooth on the remaining surface. Lateral area of propodeum with strong reticulate rugose. Hind femur 4.2x as long as deep. Longer spur of hind tibia 0.44x as long as hind basitarsus. Stigma 1.86x as long as wide, receiving radial vein at its apical 0.35. Costal part of radial cell 0.57x as long as depth of stigma; posterodistal side of stigma weakly convex. First radial vein oblique, 1.6x as long as wide. Second radial vein straight. Posterior margin of hind wing with a shallow notch at 0.35 from its base.

Abdominal stalk as long as wide in dorsal view, with eight strong longitudinal ridges. Abdominal stalk 1.2x as long as deep in lateral view, upper margin straight, without transverse ridge at the base, but with five strong sloping longitudinal ridges. Base of syntergite with median groove reaching to 0.75 of space between the thyridia, on each side with 5-6 irregular lateral grooves; sublateral

groove shorter than median groove. First thyridium 6.0x as wide as long, separated by 0.45x the width of one thyridium. Hairs on syntergite sparse, none of them close to the lower margin of the syntergite. Clasper elongated triangular, sharp at tip.



Figs. 9-15. *Exallonyx inconditus* Liu, He and Xu, NEW SPECIES. 9. Antenna. 10. Front wing. 11. Hind leg. 12. Posterior part of thorax (lateral view). 13. left part of propodeum (dorsal view). 14. abdominal stalk and basal syntergite (lateral view). 15. Abdominal stalk and basal syntergite (dorsal view).

Female: Unknown.

Holotype: Male, CHINA, Liaoning Province: Lingyuan, 8.VII.2002, Coll. Yiping Wang, No.20030615, deposited in ZU.

Distribution: China (Liaoning).

Etymology: This specific name is derived from the Latin adjective *inconditus* (irregular), and refers to the irregular lateral grooves on the syntergite.

Remarks: This species is similar to *E. crenicornis* Nees, 1834, but different from the latter by the following features: cheek 0.67x as long as shortest diame-

ter of eye; upper edge of pronotum with a haired band about 2 hairs wide; metapleuron with irregular reticulate wrinkles and moderately dense hairs, almost without smooth area.

***Exallonyx laevipropodeum* Liu, He and Xu, NEW SPECIES**

(Figs. 16-23)

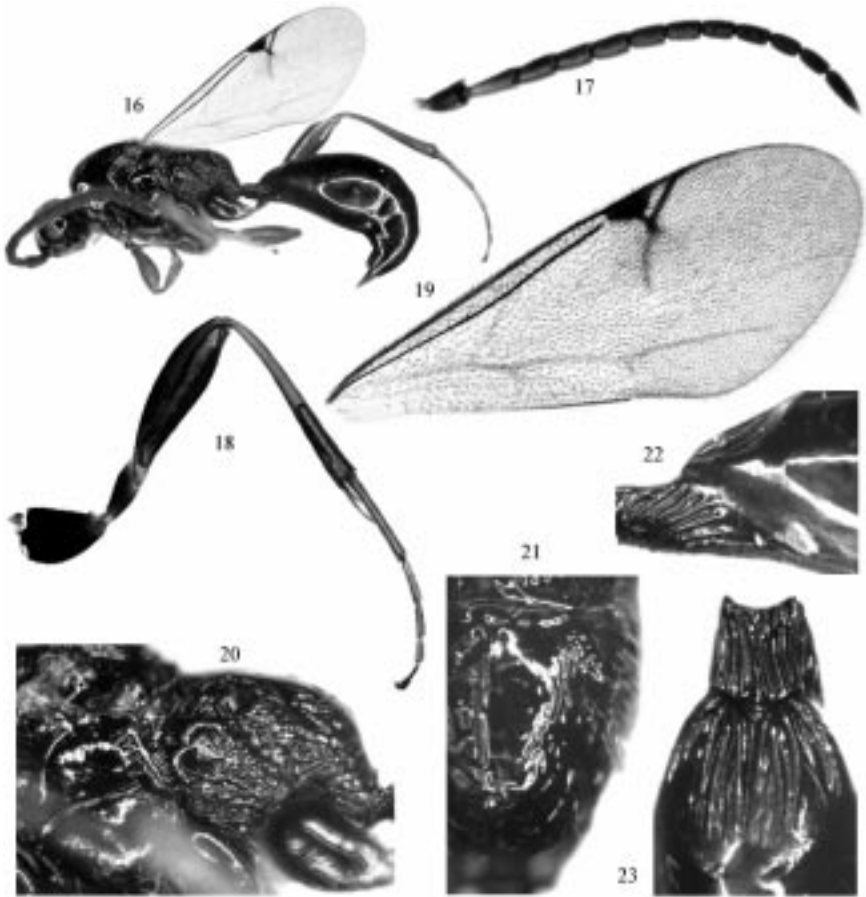
Diagnosis: Temple 1.1x as long as eye in dorsal view. Flagellar segments without tyloids. Lower corner of pronotum with one pit. Smooth area of metapleuron 0.35x its total length and 0.5x its total width. Upper face and hind face of propodeum mostly smooth. Upper face of abdominal stalk with seven strong longitudinal ridges, median ridge shorter than others; lateral side of abdominal stalk with one short transverse ridge at the base, followed by six strong sloping longitudinal ridges. Syntergite with median groove reaching to 0.83 of space between the thyridia, each side with three lateral grooves. First thyridium 6.0x as wide as long.

Description: Male. Front wing 4.0 mm long. Body black. Palpi fulvous. Labrum and apical half of mandible reddish brown. Tegula brown. Antenna blackish brown. Front coxa blackish brown, mid and hind coxae black; trochanters blackish brown; femora, tibiae and hind tarsus reddish brown; front and mid tarsi fulvous. Wings hyaline, infusate. Stigma and strong veins dark reddish brown. Weak veins light yellow.

Temple 1.1x as long as eye in dorsal view. Cheek 0.44x as long as longest diameter of eye, 0.75x as long as shortest diameter of eye. Clypeus 3.0x as wide as long, evenly convex, its apex truncate. Second flagellar segment 2.4x as long as wide. Tenth flagellar segment 1.9x as long as wide. Last segment 1.85x as long as penultimate segment. Tyloids absent. Area between antennal sockets with a moderately high carina. Occipital carina of normal height.

Pronotum with 4-5 transverse wrinkles on collar. Epomia strong. Side of pronotum without hairs behind epomia and carina on collar. Upper edge of pronotum with a haired band about 3 hairs wide. Lower corner of pronotum with one pit. Front edge of mesopleuron with a patch of hairs on upper corner and a patch of hairs above the horizontal groove. Bare area between these two patches 1.6x as long as tegula. Speculum with sparse hairs on upper 0.35 of its surface. Lower half of mesopleuron with very sparse hairs, except for a hairless zone along the horizontal groove; posterior part of lower corner with some parallel wrinkles. Smooth area of metapleuron 0.35x its total length and 0.5x its total height. The remaining of metapleuron with irregular reticulate wrinkles. Upper margin of propodeum arcuate in lateral view. Upper face and hind face of propodeum mostly smooth, except for very weak wrinkles on the posterolateral margin. Median ridge of propodeum incomplete and reaching to middle of hind face. Lateral area of propodeum with weak and indistinct reticulate wrinkles. Hind femur 3.8x as long as deep. Longer spur of hind tibia 0.5x as long as hind

basitarsus. Stigma 2.0x as long as wide, receiving first radial vein near its middle. Costal part of radial cell 0.67x as long as depth of stigma; posterodistal side of stigma straight. First radial vein oblique, 1.2x as long as wide. Second radial vein straight, meeting first radial vein with a stub. Posterior margin of hind wing with a shallow notch 0.35 from its base.



Figs. 16-23. *Exallonyx laevipropodeum* Liu, He, and Xu, NEW SPECIES. 16. Habitus (lateral view). 17. Antenna. 18. Front wing. 19. Hind leg. 20. Posterior part of thorax (lateral view). 21. Left part of propodeum (dorsal view). 22. Abdominal stalk and basal syntergite (lateral view). 23. Abdominal stalk and basal syntergite (dorsal view).

Abdominal stalk 1.2x as long as wide in dorsal view, with seven strong longitudinal ridges, median ridge shorter than others. Abdominal stalk as long as deep in lateral view, upper margin straight, with one short transverse ridge at the base,

followed by six strong sloping longitudinal ridges, none of them contact each other. Base of syntergite with median groove reaching to 0.83 of space between the thyridia, on each side with three lateral grooves; lateral grooves as long as median groove, deep and distinct on basal half, shallow and indistinct on apical half, with a lot of fine grooves deriving from the apical half of lateral grooves. First thyridia 6.0x as wide as long, separated by 0.4x the width of one thyridium. Hairs on syntergite sparse, none of them close to the lower margin of the syntergite. Clasper triangular, straight, sharp at tip.

Variation: Temple 0.9-1.1x as long as eye in dorsal view. Front coxa reddish brown to blackish brown. Forewing 3.8-4.0 mm. Fine grooves deriving from lateral grooves on the base of syntergite numerous and long, some of them may reach the front of the first thyridium.

Female: Unknown.

Type Material: Male, CHINA, Guizhou Province, Mt. Fanjingshan, 1.VIII.2001, Coll. Yun Ma, No.200108308, deposited in ZU. Paratypes, 3 males, date and locality as the type, Coll. Meihua Piao, No.200107623, 200107625, 200107631, deposited in ZU; 1 male, locality as the type, 12.VII.1993, Coll. Xuexin Chen, No.938391, deposited in ZU.

Distribution: China (Guizhou).

Etymology: This specific name is derived from the Latin adjective *laev-* (smooth) + *propodeum*, referring to the smooth upper and hind face of the propodeum.

Remarks: This species resembles *E. recavus* Townes and Townes, 1981, but can be easily separated from the latter by having the upper face and hind face of the propodeum mostly smooth, except for very weak wrinkles on the posterolateral margin; upper face of abdominal stalk with seven strong longitudinal ridges, median ridge shorter than others; lateral side of abdominal stalk with one short transverse ridge at base, behind which six strong sloping longitudinal ridges.

DISCUSSION

Among the six known species, only the male of *E. crenicornis* Nees has tyloids on its flagellum, the other five species are without tyloids on flagellar segments (Townes and Townes, 1981). Both *E. densirugolosus* sp. nov. and *E. inconditus* sp. nov. resemble *E. crenicornis* Nees in having tyloids on the flagellum, but differs from the latter mainly by a haired band of about 2 hairs wide along the upper edge of the pronotum, and the metapleuron is almost fully reticulately wrinkled.

E. densirugolosus sp. nov. is similar to *E. inconditus* sp. nov. in having tyloids on the flagellar segments, but differs from the latter by the incomplete median ridge on the upper and hind faces of the propodeum, the base of the syntergite with median groove reaching to 0.8 of space between the thyridia, and the sub-lateral groove which is as long as the median groove.

Among the six known species, males of *E. pallidistigma* Morley, *E. obsoletus* Say and *E. grandis* Brues have one transverse ridge on the side of their abdominal stalk. *E. laevipropodeum* sp. nov. is similar to these three species by having a transverse ridge on the side of the abdominal stalk, but can be distinguished from them by blackish brown trochanters, the abdominal stalk being as long as deep in lateral view and the hind femur which is 3.8x as long as deep.

ACKNOWLEDGEMENTS

We wish to express our grateful appreciation to Prof. Xuexin Chen and Associate Prof. Yun Ma (Institute of Applied Entomology, Zhejiang University) for their kindly help during the study. We are indebted to Dr. Jorge A. Santiago-Blay, Dr. Joroen de Rond and two anonymous reviewers whose suggestions improved the manuscript.

This research is partly supported by the National Natural Science Foundation of China (No.30370173, 30499341).

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