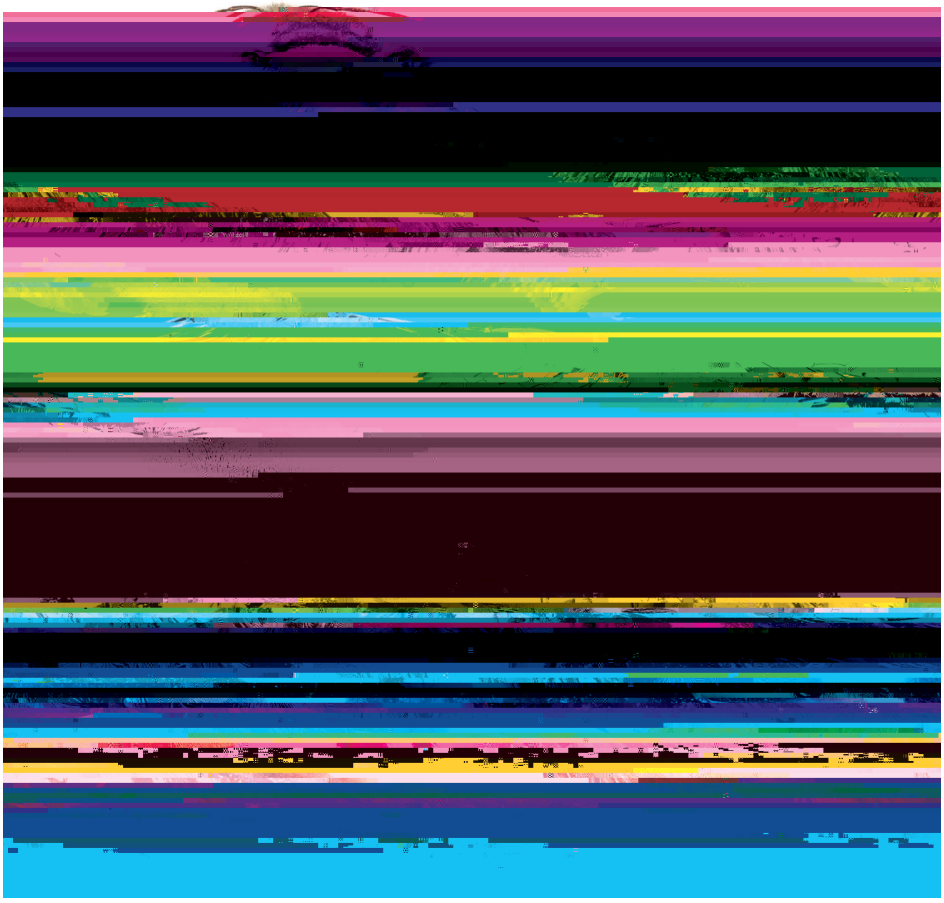
metanotum (as in subgenus *Mesotrichia* Westwood) and surpassing the posterior margin of



Figures 1–4. Habitus photomicrographs of *Xylocopa* (*Koptortosoma*) *aestuans* (Linnaeus) from central Saudi Arabia. **1** Female, dorsal **2** Female, lateral **3** Male, dorsal **4** Male, lateral.

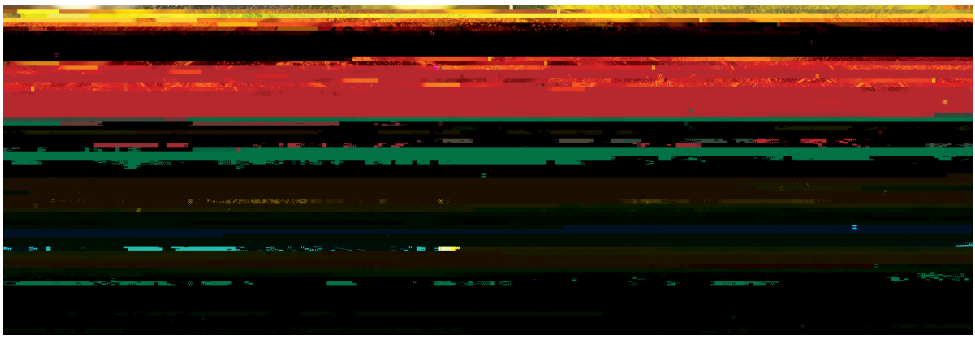
males, while females are noteworthy for the combination of a row of tubercles along each margin of the metabasitibial plate, the tridentate mandibles, and a single spine on 4 Ctenor)

Figures 12–15. Habitus photomicrographs of *Xylocopa* (*Ctenoxylocopa*) *sulcatipes* Maa from central Saudi Arabia. **12** Female, dorsal **13** Female, lateral **14** Male, dorsal **15** Male, lateral.

cence except face, dorsum of mesosoma, and apicolateral patches of rst metasomal tergum with predominantly white or pale setae (Figs 14, 15, 17); rst metasomal tergum with subhorizontal dorsal surface rounding into declivitous anterior surface; gradulus of rst metasomal tergum laterally curved posteriorly; male terminalia as in gures 18–22.

Comments. Maa (1970) recorded *X. sulcatipes* from Saudi Arabia, Yemen, Israel, and Transcaspia (likely northern Iran, or southwesternmost Turkmenistan), while Vicidomini (2004) gave localities in Jordan. e records of *X. fenestrata* from the United Arab Emirates (Dathe 2009) are likely *X. sulcatipes*, and this material should

Maa (1970). We have found that Maa's (1970) characterization of the terminalic di erences holds well for observed populations and the species he recognized appear to be good (Engel pers. obs.).



Figures 16–17. Faces of Faces of n694 0 Td[(F)48l2j oMkW[(anterior)1(1 Tuursa55883n2[(F)48(aces of n6() 48

Key to the Species of *Xylocopa* in Central Saudi Arabia

1 Males **2**

– Females **3**

2 Bee covered by dense yellow pubescence; rst metasomal tergum with subhorizontal dorsal surface abruptly and angulately separated from declivitous anterior surface; gradulus of rst metasomal tergum transverse, lateral extremities of gradulus not directed posteriorly; terminalia as in gures 7–11 .. .. ***X. aestuans* (Linnaeus)**

– Bee covered by largely fuscous to black pubescence except face, dorsum of mesosoma, and apicolateral patches of rst metasomal tergum with predominantly white or pale setae; rst metasomal tergum with subhorizontal dorsal

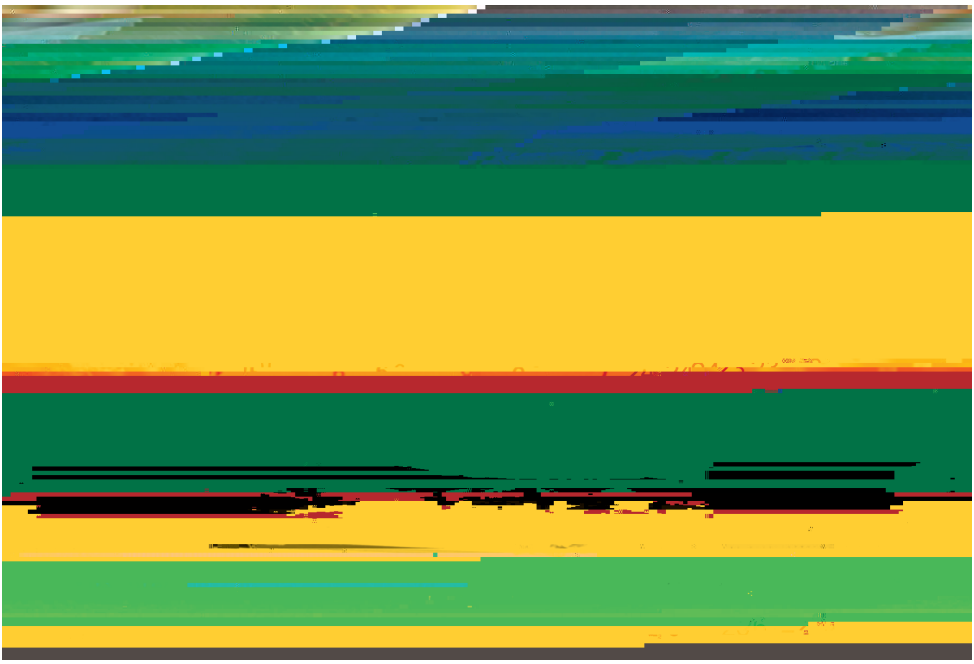
surface rounding into declivitous anterior surface; gradulus of rst metasomal tergum laterally cured posteriorly; terminalia as in gures 18–22 ....***X. sulcatipes* Maa**

3 Mesosomal dorsum densely coered by yellow pubescence obscuring underlying integument; face with largely white or pale pubescence; pygidial plate unarmed; posterodorsal margin of mesoscutellum projecting beyond posterior margin of metanotum; mandible bidentate at apex ...***X. aestuans* (Linnaeus)**

– Mesosomal dorsum largely coered by black pubescence not obscuring underlying integument; face with largely black pubescence; pygidial plate armed on each side with subapical spine; mesoscutellum not projecting oer metanotum, apical margin rounded in pro le; mandible tridentate at apex ....***X. sulcatipes* Maa**

Biological Notes on *X. sulcatipes* at Amariah

e biology of *X. sulcatipes* h...been the focus of seeral extensie ecological and



Figures 23–26. Photographs of nests of *Xylocopa* (*Ctenoxylocopa*) *sulcatipes* Maa in stems of *Calotropis procera* (Aiton) in central Saudi Arabia. **23** Nest entrance in stem of *C. procera* in the wild **24** Opened nest with series of larvae in individual cells **25** Opened nest with pupae **26** Individual pollen mass with egg situated on top.

Figure 27. Diagrams of representative nests of *Xylocopa* (*Ctenoxylocopa*) *sulcatipes* Maa in stems of *Calotropis procera* (Aiton) in central Saudi Arabia. L = larva; e = nest entrance. Line illustrations by M.A. Hannan.

to comprise several newly emerged females along with an older female, all of whom participated in foraging but apparently built their own cells, although further observations are needed to clarify this point.

Although *X. sulcatipes*, like other *Xylocopa*, is polylectic, females were observed foraging mostly from *C. procera* and it was there that males were seen to approach and grab females for mating. In addition to foraging at *C. procera*, females were observed visiting *Reseda alba* L. (Resedaceae) and radish [*Raphanus sativus* L. (Brassicaceae)]. Given that species of *Xylocopa* may be useful for agricultural pollination (Keasar 2010) it may be bene cial for standing crops in central Saudi Arabia to be surrounded by suitable native vegetation including *C. procera*, thereby providing ample nesting sites to encourage the establishment of sustainable and large populations of these bees. No associated organisms were found among the nests observed.

Acknowledgements

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