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## Geographical Races of Old World Screw-Worm Fly, *Chrysomya bezziana* Villeneuve, 1914, in South-Western Iran

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**Abstract:** A morphological analysis was undertaken with objective of identifying markers for geographical population of Old World screw worm flies, *Chrysomya bezziana* Villeneuve (Diptera: Calliphoridae) in Khoozestan province, South Western Iran. During May 2006 to August 2007 the larvae of *Chrysomya* collected from infested animals (Mostly sheep) and were incubated under suitable substratum in the Entomology laboratory. Totally 986 specimens were examined and geographical races of screw-worm fly were identified based on morphological characters by using diagnosis key. The study of morphological characters of the Old World screw worm flies population of South western Iran suggested that specimens are the same with Arabian race characters and demonstrates that the outbreak of *C. bezziana* in Iran related to populations that originated from Arab countries of the Persian Gulf like United Arab Emirates.

**Key words:** *Chrysomya bezziana*, Old World screw worm, Calliphoridae, myiasis

### INTRODUCTION

The Old World screw worm fly (SWF), *Chrysomya bezziana* Villeneuve is warm-blood animals obligate myiasis parasite including human and livestock. Maggots of flies cause economic losses in livestock production in some countries where the fly occur. This species has public health hazards in man. Infestation of human by larvae of *Chrysomya bezziana* was reported by Djalayer *et al.* (1978). Navidpour *et al.* (1996) reported the first out break of myiasis caused by *Chrysomya bezziana* from southern and south-western of Iran.

*C. bezziana* distributed in most tropical and subtropical areas of Africa, Indian Subcontinent, South East Asia and New Guinea (Norris and Murray, 1964; Sutherst *et al.*, 1989; Rohela *et al.*, 2006; Lee *et al.*, 2005; Roszalina and Rosalan, 2002; Yuca *et al.*, 2005). The Old World screw worm fly also occurs in some countries like Kuwait, Bahrain and Qatar (Rajapaksa and Spradbery, 1989), Saudi Arabia (Alahmed, 2002) and Iraq (Al-Izzi *et al.*, 1999). Spradbery (1991) proposed three geographical races of the Old World screw-worm (Africa, Arabian and South-East Asian) in regard to anatomical difference between population of *C. bezziana* from different parts of its geographical range. There is no report about geographical races of *C. bezziana* in Iran.

The present study is the first research related to geographical races of *C. bezziana* population on based of morphological studies in South-West of Iran.

### MATERIALS AND METHODS

The present study concentrates on adult flies that reared in the Entomology Research Center of Razi Research Institute (Ahvaz-Iran). During May 2006 to August 2007 the larvae of *Chrysomya* collected from infested animals (Mostly sheep) and were incubated under suitable substratum in the Entomology laboratory.

In this study totally 986 specimens (656 females and 330 males) were examined. All studies were carried out under a stereomicroscope (X60 magnification). We used some morphological characters for identifying distinctive geographical races of Old World screw-worm as Spradbery used them in 1991 (Fig. 1, 2).

### RESULTS

The study of morphological characters of adult flies especially wings frontal setulae and hairs of thorax showed that:

- Wing base is completely clear
- Soft hair of the thorax (pleura) are pale

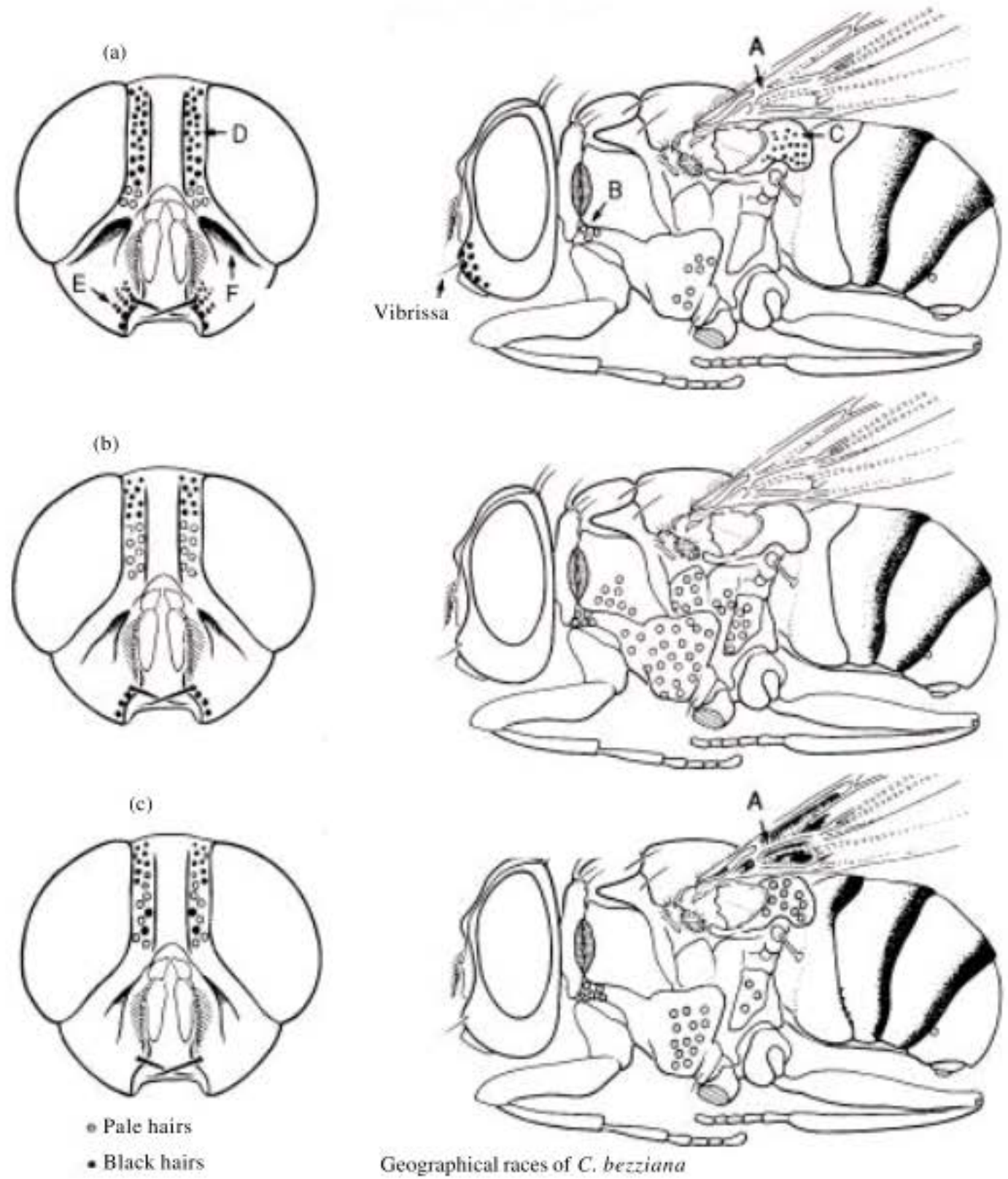


Fig. 1: Morphological differences between geographical races of *Cheysomyia bezziana*. (a) SE Asia (Body color blue/black), (b) Arabian (Body color blue/green) and (c) Africa (Body Color green/blue)

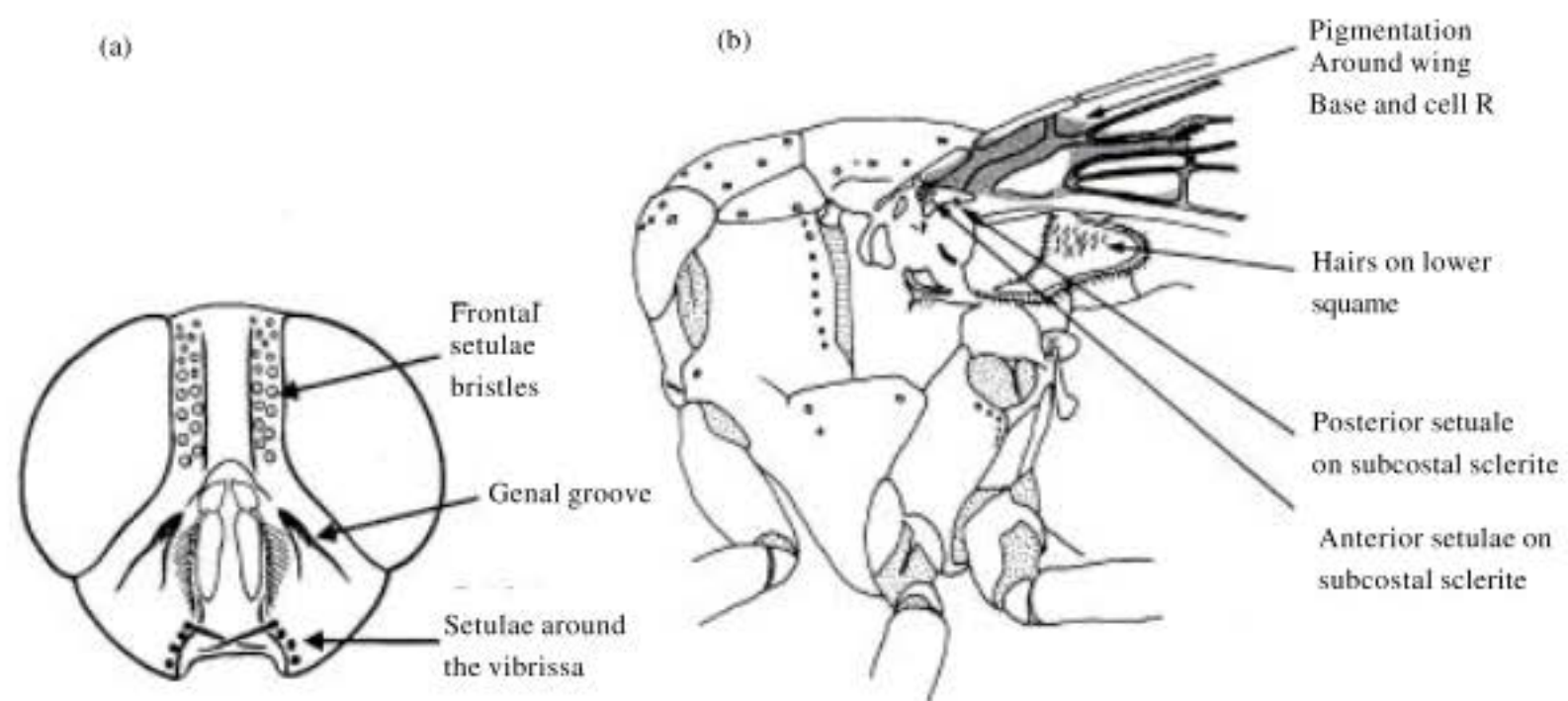


Fig. 2: Characters used in morphological analysis; (a) head characters (b) thorax and wing character

- Lower (posterior) squama is brilliantly white, with long white hairs
- A few of setulae below vibrissa are black
- Genal groove below compound eye not heavily indented (Fig. 2a, b)

The three morphological races proposed by Colles (in Spradbery, 1991) were based on samples from three countries, i.e., PNG (South-East Asia), the United Arab Emirates (UAE) (Arabian) and Zimbabwe (Africa). The present study on morphological characters of *C. bezziana* flies (both sex) showed that the results are same with characters of Arabian race (Fig. 1a-c), were explained by Spradbery (1991) and Hall *et al.* (2001).

### DISCUSSION

Morphological studies of geographical races in *Chrysomya bezziana* are useful for epidemiological aspects of infestation.

Based on morphological studies, it has been proposed that there are three geographical races of the Old World screw-worm fly: Arabian, African and south-east Asian races (Spradbery, 1991).

Hall *et al.* (2001) used both the morphological and molecular analyses for demonstrating regional differences in populations of Old World screw-worm. Morphological analysis suggested that African and Most Asian populations were more similar to each other than Papua New Guinea (PNG) populations. Nevertheless, the Molecular evidence indicated that the Asian race was more closing related to those of PNG. However, both analyses described that the PNG populations were distinctive.

Besides, some studies that did on morphology by Spradbery (1991), earlier investigations to differentiate population of *Chrysomya bezziana* have used cuticular hydrocarbons (Brown *et al.*, 1992), cytology (Bedo, 1991) and enzyme electrophoresis (Strong and Mahon, 1991).

The low generic diversity within the very large geographical range of each lineage suggests that Old World screw worm is capable of widespread dispersal, naturally or with human assistance (Hall *et al.*, 2001). The human trade in animals has so far transferred Old World screw worm between different countries. In this way the duration of the life stage of Old World screw worm is very important. For an animal infected in one continent to release mature larvae of Old World screw worm in the other, assuming non-detection at the port entry, then the duration of the passage would need to be in the order of less than 6-7 days (Spradbery, 1994). Therefore most problems are likely to arise from relatively short distance livestock movements.

The present study demonstrates that the human trade in animals and goods between Iran and Arabian countries can be having major role in the outbreak of *C. bezziana* in Iran, specially South parts. As argued, morphological characters of Iranian population flies are more similar to Arabian races have reported by Hall *et al.* (2001) and Spradbery (1991).

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### REFERENCES

- Al-Izzi, M.A.J., A.A. Al-Taweel and F.A. Jassim, 1999. Epidemiology and rearing of old world screw-worm in Iraq. *Iraqi. J. Agric.*, 4: 155-160.
- Alahmed, A.M., 2002. Incidence of miasis in seep cused by *Ysomya bezziana* Saudi Arabia. *J. King Saud Univ.*, 14: 109-112.
- Bedo, D.G., 1991. Cytological characterization of heterochromin in mitotic and mitotic chromosome of the old world screw-worm fly. *Genome*, 34: 631-637.
- Brown, W.V., R. Morton and J.P. Spradbery, 1992. Cuticular hydrocarbons of the old world screw-worm fly. Chemical characterization and quantification by age and sex. *Comp. Biochem. Physiol.*, 101B: 665-671.
- Djalayer, T., M. Maleki and M. Moghtader, 1978. Human urogenital myiasis caused by *Chrysomya bezziana*. *Iranian J. Public Health*, 7: 116-118.
- Hall, M.J.R., W. Edge, J.M. Testa, Z.J.O. Adams and P.D. Ready, 2001. Old world screw-worm fly, *Chrysomya bezziana* occurs as two geographical races. *Med. Vet. Entomol.*, 15: 393-402.
- Lee, H.L., M. Krishnasamy and J. Jeffery, 2005. A case of human nasopharyngeal myiasis caused by *Chrysomya bezziana* Villeneuve, 1914 (Diptera: Calliphoridae) in Malaysia. *Trop. Biomed.*, 22: 87-88.
- Navidpour, S.H., H. Goodarzi, A.R. Pooladgar and N. Hoghooghi-Rad, 1996. Outbreak of *Chrysomya bezziana* in Khoozestan province, Iran. *Vet. Rec.*, 139: 9-217.
- Norris, K.R. and M.D. Murray, 1964. Notes on the screw-worm m fly *Chrysomya bezziana* (Diptera: Calliphoridae) as a pest of cattle in papua New Guinea. CSIRO Australia, Division of Entomology. Technica Paper, No. G1-26.
- Rajapaksa, N. and J.P. Spradbery, 1989. Incidence of the old world screw-worm fly *Chrysomya bezziana*, on livestock vessels and commercial aircraft. *Aust. Vet. J.*, 66: 94-94.

- Rohela, K., I. Jamaiah, L. Amir and V. Nissapatorn, 2006. case of auricular myiasis in Malaysia. *Southeast Asian J. Trop. Med. Public Health*, 37: 91-94.
- Roszalina, R. and R. Rosalan, 2002. Oral myiasis: Case report. *Malaysian J. Med. Sci.*, 9: 47-50.
- Spradbery, J.P., 1991. A Manual for the Diagnosis of the Screw-Worm fly. Division of Commonwealth Scientific and Industrial Research Organization, Division of Entomology, Canberra, Australia, ISBN:0 643 05268 2, pp: 64.
- Strong, K.L. and R.J. Mahon, 1991. Genetic variation in the old world screw-worm fly, *Chrysomya bezziana* (Diptera: Calliphoridae). *Bull. Entomol. Res.*, 81: 491-496.
- Sutherst, R.W., J.P. Spradbery and G.F. Maywald, 1989. The potential geographical distribution of the old world screw-worm fly, *Chrysomya bezziana*. *Med. Vet. Entomol.*, 3: 273-280.
- Yuca, K., H. Çaksen, Y.F. Sakin, S.A. Yuca, M. Kiris, H. Yilmaz and H. Çankaya, 2005. Aural myiasis in children and literature review. *Tohoku J. Exp. Med.*, 206: 125-130.