



# **Systematics and Phylogenetic Classification of the Basal Lineages of Suborder Brachycera (Diptera) in Egypt**

A thesis

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(Entomology)

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ  
﴿ يَا أَيُّهَا النَّاسُ ضُرِبَ مَثَلٌ فَاستَمِعُوا  
لَهُ إِنَّ الَّذِينَ تَدْعُونَ مِنْ دُونِ اللَّهِ لَنْ  
يَخْلُقُوا ذُبَابًا وَلَوْ اجْتَمَعُوا لَهُ وَإِنْ  
يَسْلُبْنَهُمْ الذُّبَابَ شَيْئًا لَا يَسْتَنْتِقُوهُ مِنْهُ  
صَغَفَ الطَّالِبِ وَالْمَطْلُوبِ ﴿٧٣﴾  
صَدَقَ اللَّهُ الْعَظِيمُ





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## **ABSTRACT**

**Name: Sara Ahmad Al-Sayed Al-Ashaal**

This work aimed to study 21 species under 12 families of Brachycera (Diptera) beside one outgroup species of Nematocera. Confirmed the identification of all species according keys, diagnosis, distribution and specimens examined were also given in addition to the morphometric measures of all selected studied species. The cladistic analysis was applied to study the phylogenetic classification by two programs Probiosys (using 301 binary characters) and Mesquite (using 215 multistate characters). Also, this study sequenced 205 base pairs from ITS region of 28S gene of all selected species and the comparison of the nucleotide compositions allowed phylogenetic analyses of suborder Brachycera. Cluster analysis based on both morphometric and sequence data showed less variation between the species than morphometric data only.

**Key words:** Cladistic analysis, Morphometric measures, 28S gene, Bracycera, Nematocera.

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