

- ferns, (ed.) A. F. Dyer, Academic Press, New York, 1979, p. 253.
2. Schedlbauer, M. D., *Am. J. Bot.*, 1978, **65**, 864.
  3. Khare, P. B. and Roy, S. K., *Indian J. Exp. Biol.*, 1977, **15**, 419.
  4. Niranjana, A. R. S. and Roy, S. K., *Acta Bot. India*, 1980, **8**, 129.
  5. Mehra, P. N., *Ann. Bot.*, 1952, **16**, 49.

## NECTAR DILUTION PATTERN OF BEES IN SEMI-ARID ENVIRONMENTS

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BESIDES physical and biological factors<sup>1</sup>, bee-flower interaction depends upon the concentration in which the caloric rewards are available. In semi-arid environments where more concentrated nectars are produced by flowers, the pollinators which can metabolize nectars of such high concentrations with more water economy would make a suitable partner for bringing effective pollination. The present report deals with certain aspects of this problem. In this paper differential nectar dilution capabilities of two sub-tropical bees have been presented. This study was conducted for four different days on *Pongamia glabra* vent during its flowering period in May 1986. The concentration of total sugars in the nectars sampled directly from the flowers as well as from the honey storing organ of *Apis mellifera* L. and *Megachile cephalotes* Smith was estimated with the help of pocket refractometer. The nectars were estimated at the beginning of each hour from 0700–1800 hr on all the days of observation. The average of 5 observations constituted the reading for each hour.

The data presented in figure 1 indicate that nectar concentration in *P. glabra* flowers ranged from

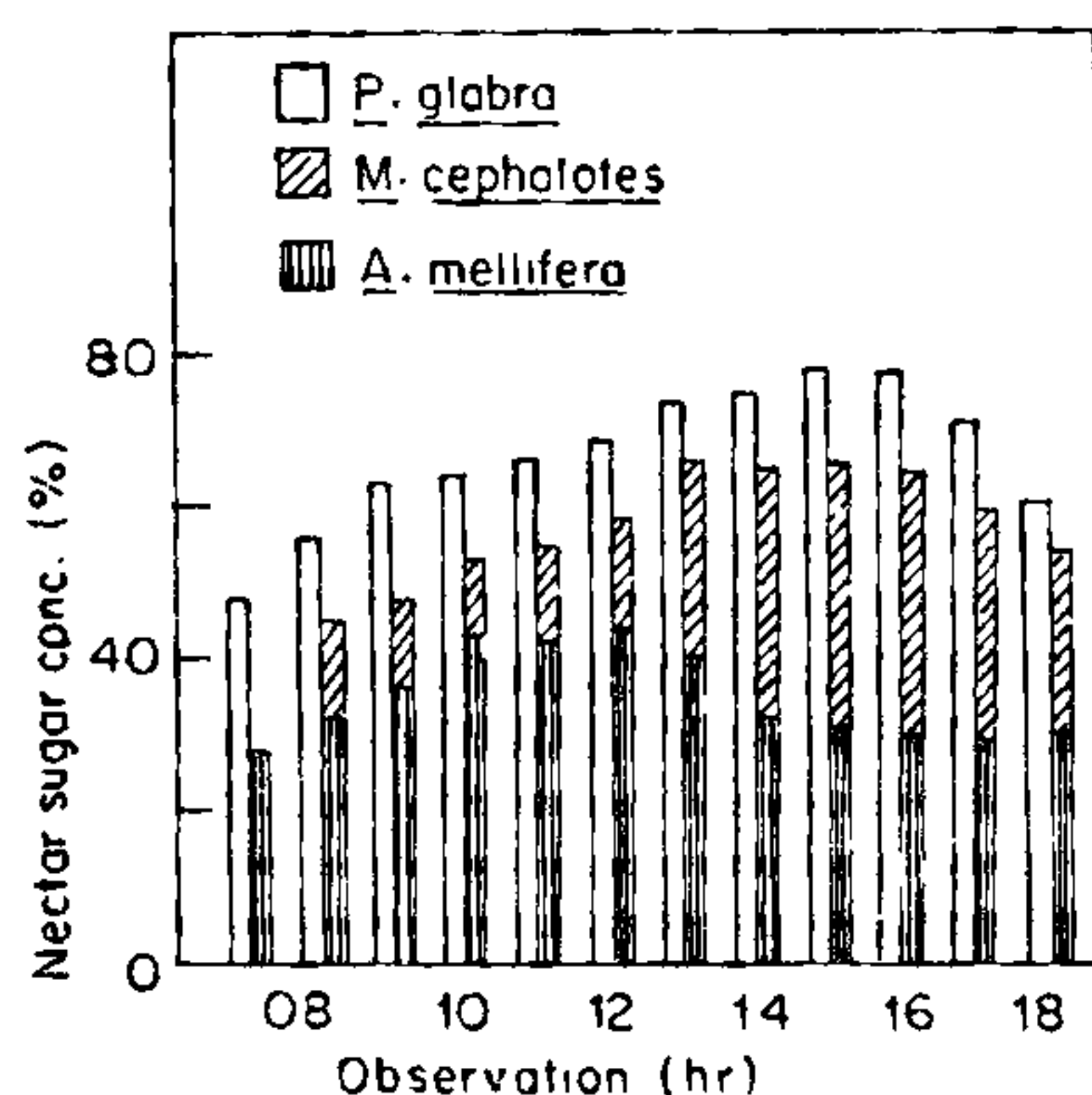


Figure 1. Histogram exhibiting dissolved solids in floral nectars and the honeysac of the bees.

48–78%, while it was 28–45% in *A. mellifera* and 45–66% in *M. cephalotes*. The dilution of nectars by each bee species may be due to water produced from the metabolization of the sugars as reported by Simpson<sup>2</sup>. The results clearly reveal that *M. cephalotes* exhibits greater water economy over *A. mellifera* as the former diluted the nectars to a lower extent than the latter. The differences exhibited in dilution of nectars may probably be due to the different physiology of two bee species. The present study clearly reveals that *M. cephalotes* is physiologically better adapted to pollinate flowers in semi-arid environments. Further research is needed in this direction to characterize the efficient pollinators of crops which grow in semi-arid environments and secrete concentrated nectars.

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1. Abrol, D. P., Ph.D. thesis, Haryana Agricultural University, Hisar, India, 1985, p. 286.
2. Simpson, J., *J. Apic. Res.*, 1964, **30**, 37.