ACTA ORNITHOLOGICA
Vol. 53 (2018) No. 2

Preferences for different types of offal by Black Kites *Milvus migrans* from urban garbage dumps of Kolkata, India

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Mazumdar S., Ghose D., Saha G. K. 2018. Preferences for different types of offal by Black Kites *Milvus migrans* from urban garbage dumps of Kolkata, India. Acta Ornithol. 53: 163–172. DOI 10.3161/00016454AO2018.53.2.006

Abstract. Facultative scavengers often forage on organic wastes from urban dumps. Despite being a major scavenging raptor in many urban areas, studies on Indian subspecies of Black Kites *Milvus migrans govinda* are very few. We studied the pattern of offal preference by Black Kites foraging in the dumping sites adjoining two major markets of Kolkata, India through cafeteria experiments, where successful foraging events and abundance of foraging Black Kites were recorded. We also carried out questionnaire surveys among 156 meat and fish sellers of 32 markets of this area to assess their offal disposal practice and understand their attitude towards Black Kites. During questionnaire surveys majority of the respondents (77.92%), indicated that Black Kites consume various kinds of offal, particularly chicken offal from garbage dumps of Kolkata. 51.92% respondents opined that Black Kite population has declined in Kolkata, and 41.03% of them believe such decline is due to food scarcity. Still many respondents (64.74%) sell their offal, which reflect their indifferent attitude towards this scavenging raptor. During 'cafeteria experiments, we noticed that foraging kites pick up small pieces of offal from the garbage dumps, particularly chicken, mutton and fish offal (in 15.45 ± 7.749, 9.7 ± 4.542 and 9.95 ± 4.951 successful foraging events/h respectively). Energy content (cal/g) of sun-dried samples of each type of offal substances revealed that the energy (calorie) of swine offal was highest followed by beef offal, mutton offal, chicken offal and fish offal. In spite of being energetically rich, beef and swine offal were less selected by Black Kites possibly because they are visibly larger than other offal, thus requires greater handling time and invites higher risk of kleptoparasitism. Successful foraging events were significantly influenced by offal type, but not by months, study sites or by the relative abundance of foraging Black Kites.

Key words: cafeteria experiment, questionnaire surveys, waste disposal, scavenger, diurnal raptor, human attitude, supplementary feeding, refuse dumps

Received — Nov. 2017, accepted — Oct. 2018

INTRODUCTION

Production, disposal and management of waste is a burning problem worldwide at present and is supposed to become even worse in future (Hoornweg & Bhada-Tata 2012). Organic waste is one of the major involuntary food subsidies produced by human activities (Oro et al. 2013). This includes food items intentionally discarded by humans such as domestic kitchen wastes, and offal from slaughter houses, butcher shops, meat and fish markets, which are considered as 'food refuse' (Blanco 1997, Oro et al. 2013). In different parts of the globe, particularly in areas with high human density and/or weak environmental policies, food refuse is often disposed in garbage dumps and are subsequently accessed and consumed by several species, including the obligate and facultative scavengers (Plaza & Lambertucci 2017), given that these refuse consist of plant components (vegetables and fruits), animal wastes or offal substances (parts of meat, fish and chicken etc.) and other discarded food substances of anthropogenic origin (Parfitt et al. 2010, Oro et al. 2013).

Scavenger birds perform several important ecosystem services like removal of organic waste, avoiding disease spread and recycling of nutrients (Sekercioğlu et al. 2004, Sekercioğlu 2006, Ogada et al. 2012). Therefore, scavenging (either obligate or facultative) has been identified as a major stabilizing function in food webs (Wilson & Wolkovich 2011). Despite such important ecological services, they are also amongst the most threatened avian guilds (Sekercioğlu et al. 2004). Scavenger and facultative scavenger birds often exploit concentrated supplies of animal wastes in urban refuse