



A cross-sectional survey to evaluate the pet squirrel population and ownership profiles

Dario d'Ovidio^{a,*}, Federica Pirrone^b

^a Private practitioner, Naples, Italy

^b Department of Veterinary Medicine, University of Milan, Milan, Italy



ARTICLE INFO

Keywords:

Pet squirrels
Exotic companion mammals
Husbandry
Alien species
Veterinary care

ABSTRACT

While the presence of squirrels in households is growing, little data is published on their status in captivity. A web-based questionnaire for owners was devised eliciting information about them, their squirrels and their squirrels' husbandry and health. One hundred owners answered the survey, with most respondents being located in Europe (n = 81). Only data from these respondents were analysed. Twenty-five percents of the owners housed an invasive non-native species of European Union concern (*S. carolinensis* and *T. sibiricus*), some of which were younger than three years of age and all but one were sexually intact. This is of particular concern, as the acquisition of these invasive species is illegal since 2015 (European Union Regulation 1143/2014), due to the severe threats they pose to biodiversity. Moreover, escapes derived from improper keeping of intact specimens may augment feral populations or establish new colonies. Among 81 cases, only 5% were neutered, mostly for health reasons. Sixty-three percents of the squirrels had health problems, particularly dermatologic (52%) and intestinal disorders (34%). Most owners reported to visit the veterinarian only if their pet was ill rather than for preventive care.

This is the first survey on pet squirrel ownership reported to date. Information that emerges from this study will be useful in implementing rational veterinary strategies for managing pet squirrels properly and, in parallel, meeting the challenges arising from private keeping of alien species.

1. Introduction

Rodents have become increasingly popular as pets worldwide with approximately 22 million small mammals, excluding dogs and cats, counted in the European Union in 2016 and 11% increase in the number of US households owning rodent pets between 2007 and 2012 (Lennox and Bauck, 2012; FEDIAF, 2017). Amongst these species are squirrels (Family: *Sciuridae*), which comprise 58 genera and 285 species native to the Americas, Africa, Europe and Asia (Thorington et al., 2012). Despite their growing popularity there is a lack of published information on pet squirrels. Very little is known about the species that are held in captivity, their husbandry conditions, behaviour, general wellbeing and veterinary care (d'Ovidio et al., 2015; Fehr et al., 2015). Assisting owners in understanding squirrels' characteristics and natural behaviours might help them meet the welfare needs of their pets and, as for other species, is an important part of veterinary practice to help prevent health and behaviour problems (d'Ovidio et al., 2016).

In addition, alien squirrel species have been introduced in the European continent since the second half of the XIXth century and are

progressively replacing the native Eurasian red squirrel (*Sciurus vulgaris*) in Italy as in the United Kingdom (UK) (Bertolino et al., 2014; Tattoni et al., 2005). In particular, native red squirrels are threatened by alien grey squirrels (*Sciurus carolinensis*) through exploitation competition and spillover of squirrelpox virus (SQPV) (Chantrey et al., 2014). Although they are currently being culled as part of invasive species control programs (Bertolino et al., 2016; Chantrey et al., 2014; Schuchert et al., 2014) in the UK, Ireland and Italy, it seems that they are still kept – illegally – as pets (Davenport and Collins, 2016; Romeo et al., 2018). Other alien squirrels in Europe include the Siberian chipmunk (*Tamias sibiricus*) and the Finlayson's squirrel (*Callosciurus finlaysonii*). The Siberian chipmunk is a small semi-terrestrial squirrel, with a natural distribution comprising the Eurasian taiga zone, from Finland and westernmost Russia (Karelia) eastwards to eastern Siberia, Japan and eastern China (Bertolino et al., 2000). Naturalized colonies derived from escaped animals have become established in Austria, Belgium, France, Germany, the Netherlands, Switzerland, and different sites of North and Central Italy. Although no interaction with other species is known (Bertolino et al., 2000), *T. sibiricus* is already included

* Corresponding author.

E-mail addresses: dariodavidio@yahoo.it (D. d'Ovidio), federica.pirrone@unimi.it (F. Pirrone).

in the list of invasive alien species of European Union concern (Bertolino et al., 2016).

Finlayson's squirrel is an arboreal rodent native to Thailand, Myanmar, Laos, Cambodia and Vietnam (Ancillotto et al., 2018). A few populations of this squirrel, introduced through the pet trade (Bertolino and Lurz, 2013), have established outside its native range in the last 35–40 years. About 16–18 years ago it has been introduced to Italy, and the effects of

this species include tree bark stripping, consumption of fruits and seeds in crops, and

damage to electric cables (Bertolino et al., 2015; Mori et al., 2016). Although the population

of *C. finlaysonii* has expanded rapidly, monitoring has been practically nonexistent (Bertolino et al., 2015).

In general, despite what has been said so far, there is no official data regarding the acquisition and recommended husbandry for these species, which represent a threat to biodiversity.

The present study aimed to provide a characterization of squirrel ownership and a representative point sample of the current state of care and welfare of pet squirrels in Europe.

2. Materials and methods

Participants were recruited via the Internet. The questionnaire used for assessment was posted online and published in the media (pet magazines and web sites, including Facebook) both in Italian (RESCOP, Relazione Scoiattolo-Proprietario) and English language (OSREL, Owner-Squirrel Relationship). Participation was restricted to owners who were older than 18 years and directly involved in the pet's care. Owners were asked to complete the survey for only one squirrel per household, preferably by choosing one at random (e.g. put their names in a container and select one with eyes closed). A self-selected, convenience sample of 100 squirrel owners completed the online survey. A subset of these data ($n = 81$) consisting entirely of squirrels housed inside of Europe, of either sex and aged 0–6 months to > 10 years old at the time of the study, was selected for analysis.

The survey was adapted from a standardized questionnaire focused on other pet species that have already been included in previous papers and consists of 4 sections (d'Ovidio et al., 2016; Pierantoni et al., 2011; Pirrone et al., 2015a, b; Pirrone et al., 2016). The first section contained questions on the participant's demographics, such as sex, age, municipality of residence, country/region of residence, marital status, household, presence and number of children, age of the youngest child, and education. In the second section, owners are asked to indicate demographic variables for their squirrels, including name, species, age, sex, sexual status and main reason for neutering, age at acquisition, and source. Within the third section, 18 common types of behaviours, some of which potentially problematic, were listed. Squirrel behaviour was not addressed in this paper, as it will be the main theme of another article. The fourth section contained single-choice questions related to the housing, husbandry and clinical history of the squirrels (Table 1).

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, version 25.0 (Armonk, NY: IBM Corp). Values were reported as actual numbers and percentages.

One-sample Pearson's χ^2 test and Pearson's χ^2 test of independence in 2×2 contingency tables were applied to analyse significant differences between groups of squirrels. Fisher's exact test was performed when the expected frequency of the observations was lower than 5. A 2-sided $p < 0.05$ was considered statistically significant.

3. Results

3.1. Section 1—Owner factors

Most respondents were female (52%, 42/81) and were between 18

and 30 years of age (37%, 30/81). The majority of participants lived in urban settings (98%, 79/81) and came from Italy (96%, 78/81). Italian owners were drawn from all over the country, although most were from the southern regions (63%). Foreign participants (4%) were from France ($n = 3$).

Most of the owners were married or long term committed (44%, 36/81) and resided in a childless household (84%, 68/81). Half of the respondents (54%, 44/81) had a high school diploma, whereas 31% (25/81) had a university degree, and 15% (12/81) had attended secondary school or less. The most common reason for squirrel acquisition was "because I love squirrels" (54%, 44/81).

3.2. Section 2—Squirrel factors

Overall, squirrels belonged to 8 different species (Table 2): *T. striatus*, $n = 50$; *S. carolinensis*, $n = 6$; *T. sibiricus*, $n = 14$; *Callosciurus prevosti*, $n = 8$; *Callosciurus notatus*, $n = 2$; *S. granatensis*, $n = 2$; 6; *S. vulgaris*, $n = 1$.

Twenty-five percents (20/81) of the respondents owned invasive non-native species of Union concern (*S. carolinensis* and *T. sibiricus*). Of these, 19 lived in Italy and 1 in France. The sample had a balanced sex ratio of squirrels: 43% (35/81) females vs 54% (44/81) males, but 3% (2/81) of the owners were unaware of their pet's sex.

The vast majority of squirrels were intact: 90% (73/81), 5% (4/81) were neutered and for 5% (4/81) of them the sexual status was unknown to the owners.

All the squirrels belonging to alien invasive species, except one, were sexually intact (Table 2). Of the 5% of the respondents who opted to neuter, reasons for neutering included health reasons (50%, 2/4), behaviour problems (25%, 1/4), and legal requirement (25%, 1/4). Most squirrels were young (37%, 30/81: 1–3 years, 32%, 26/81: < 1 year), 27% (22/81) were 4–6 years of age, 3% (2/81) were between 7 and 9 years of age, while only 1% (1/81) was older than 10 years old.

The age at which they were obtained ranged from before 6 months to over 10 years, with the most common age range being 0 to 6 months (72%, 58/81). More squirrels came from a pet shop (44%, 36/81) rather than a friend/relative (27%, 22/81), a breeder (17%, 14/81) or other sources (11%, 9/81).

Squirrels of alien species were more likely to be purchased from a breeder ($p = 0.046$) than from other sources. Seventy-one percents (5/7) of the alien species coming from a breeder were younger than 3 years old at the time of the survey, as were all those coming from private sources, while pet shop-traded squirrels were all older than 4 years at the time of the study.

3.3. Section 4—Squirrel housing and management

3.3.1. Companionship

Fifty-four percents (44/81) of the owners reported that their squirrel had at least one squirrel companion in sight. The majority had one squirrel companion (42%, 34/81), 33% (27/81) had 2 conspecific companions, 17% (14/81) had 3 squirrel companions and 7% (6/81) had > 4 squirrel co-habitants. The vast majority of the squirrels were housed individually (75%, 61/81), 7% (6/81) shared the same hutch with another squirrel and 17% (14/81) had 2 cage-mate squirrels.

Forty percents (8/20) of the cage-mate squirrels were of the opposite sex to that of the squirrel surveyed, 15% (3/20) were of the same sex, 45% (9/20) were of both sexes. Four squirrels, either females or males, belonging to non-native alien species of Union concern (*T. sibiricus* = $n. 2$, *S. carolinensis* = $n. 2$) shared the same hutch with another squirrel of the opposite sex.

In most cases (62%, 50/81), other species were also kept as pets in the household, particularly dogs (42%, 21/50), parrots (30%, 15/81) and cats (14%, 7/50).

Download English Version:

<https://daneshyari.com/en/article/8962315>

Download Persian Version:

<https://daneshyari.com/article/8962315>

[Daneshyari.com](https://daneshyari.com)