

Rueppel's Snake-eyed skink, *Ablepharus rueppellii* (Gray, 1839) (Reptilia: Squamata: Scincidae): Distribution extension and geographic range in Israel

Uri Roll¹, Oliver Tallowin², Daniel Berkowicz³, Erez Maza^{3,4}, Yael Ostrometzky⁴, Alex Slavenko⁴, Boaz Shacham⁵, Karin Tamar⁴ and Shai Meiri^{3,4*}

1 School of Geography and the Environment, University of Oxford, South Parks Road, Oxford, OX1 3QY, United Kingdom.

2 Furze, South Zeal, Okehampton, EX20 2PQ. Okehampton, Devon, UK.

3 Tel Aviv University, National Natural History Museum, 69978, Tel Aviv, Israel

4 Tel Aviv University, Faculty of Life Sciences, Department of Zoology, 69978, Tel Aviv, Israel

5 The Hebrew University of Jerusalem, National Natural History Collections, 91904 Jerusalem, Israel.

* Corresponding author. E-mail: uncshai@post.tau.ac.il

ABSTRACT: We report a new locality for Rueppel's Snake-eyed skink (*Ablepharus rueppellii*) in Southern Israel – near Shivta Junction. This record extends the known distribution of this species in Israel by ~25km. We examined all known localities of this species in Israel and the adjacent Sinai Peninsula (Egypt), and discuss some discrepancies between them and currently published range maps, including the one produced by the IUCN.

Rueppel's Snake-eyed skink, *Ablepharus rueppellii* (Gray, 1839) is a small (17–45 mm SVL, 0.1–1.2 g [Meiri 2010]), and measurements of specimens in the National Natural History Museum at Tel Aviv University [TAUM]), diurnal, terrestrial and secretive skink, frequently found under rocks in densely vegetated areas (Amitai and Bouskila 2001; Disi *et al.* 2001; Baha-El Din 2006; Bar and Haimovitch 2012, and personal observations by the authors). Its preferred microhabitat seems to be areas with large amounts of leaf litter with abundant rocks under which it shelters. It inhabits Syria, Egypt (only the Sinai Peninsula), Jordan, Israel (Werner *et al.* 2006; Uetz 2012) and, in all likelihood, Lebanon (see below). In Israel it is known from virtually all regions with Mediterranean climate, as well as from some areas in the centre of the Negev desert, especially the high (to ~1000 m) Negev Mountains (Arbel 1984; Amitai and Bouskila 2001; Bar and Haimovitch 2012). The skink is quite common throughout its range, but is absent from loose sands (Arbel 1984, and personal observations by the authors). It was therefore unknown from the Agur Sands area of the western Negev, near the Israeli-Egyptian border.

On the 15th and 16th of May, 2012 we conducted a reptile survey in the Western Negev sands, and Negev Mountains – as part of an Israel-wide survey. On the morning of the 15th we surveyed the sandy area north of Shivta Junction (roughly 30°56'46" N, 34°29'24" E). We found several specimens of *Acanthodactylus aegyptius* Baha El Din, 2007 and *A. scutellatus* (Audouin 1827) (Lacertidae) on the dunes, as well as a juvenile *Chamaeleo chamaeleon* (L. 1758) (Chamaeleonidae), whereas on harder ground slightly to the south (but still north of the junction and the main road) we found *Acanthodactylus boskianus* (Daudin 1802). Then two of us (UR and OT) saw, but could not capture, an individual they identified as *Ablepharus rueppellii*. The specimen was found under a small rock at a basin of a dry

~5 m waterfall of a small, dry, seasonal stream (wadi) with limestone walls at 30°56'06" N, 34°29'20" E (Figure 1).

We returned to the same place the next morning, where at 07:05 h we caught an individual *A. rueppellii* (Figure 2). The individual was found inside a discarded plastic cup, in the shade. It was captured, and measured (with digital Mitutoyo calipers and 20 g Pesola scales) in the field. Its SVL was 36.75 mm, its tail 50.38 mm, and it weighed 0.7 g. These measurements are well within the range of other Israeli specimens of *A. rueppellii* (Meiri 2010, TAUM data). Both the cloacal temperature of the specimen, 25.6 °C, and the air temperature at the time of capture (19 °C), were the lowest of nine measurements we took of *A. rueppellii* during March–June 2012, despite all the other specimens (29.0–34.8 °C body temperature, 22.4–28 °C air temperature) having been measured further north (including specimens collected at similar times of the day). All temperature measurements were taken using a Newtron TM-5005 portable digital thermometer. The specimen was collected under an Israeli Nature and Parks Authority (NPA) collection permit #2012/38489, and is now preserved in the TAUM collections (#R16130). The only other reptiles we found at the stream were two *Chalcides ocellatus* (Forsk. 1775) (Scincidae) individuals that were found under rocks. Their body temperatures (20.6 and 21.3 °C, both at 07:10 h) were considerably lower than that of the *Ablepharus*.

The biogeography of Rueppel's Snake-eyed skink in Israel and NE Sinai

To verify that the Shivta Junction locality indeed represents a range extension we have digitized *A. rueppellii* range maps from Werner *et al.* (2006), and Bar and Haimovitch (2012). To these we added the localities of 812 *A. rueppellii* individuals from four sources: 1. the NPA's animal observation dataset (85 observations,

Eliezer Frankenberg, pers. comm. to SM); 2. The personal observation dataset of BS (428 observed individuals); 3. the National Natural History Collections, the Hebrew University of Jerusalem (HUJ, 170 specimens); 4. TAUM specimens (129 specimens). The maps and specimens are shown in Figure 3. A full list of the coordinates for the 476 localities in the dataset is given in Appendix 1.

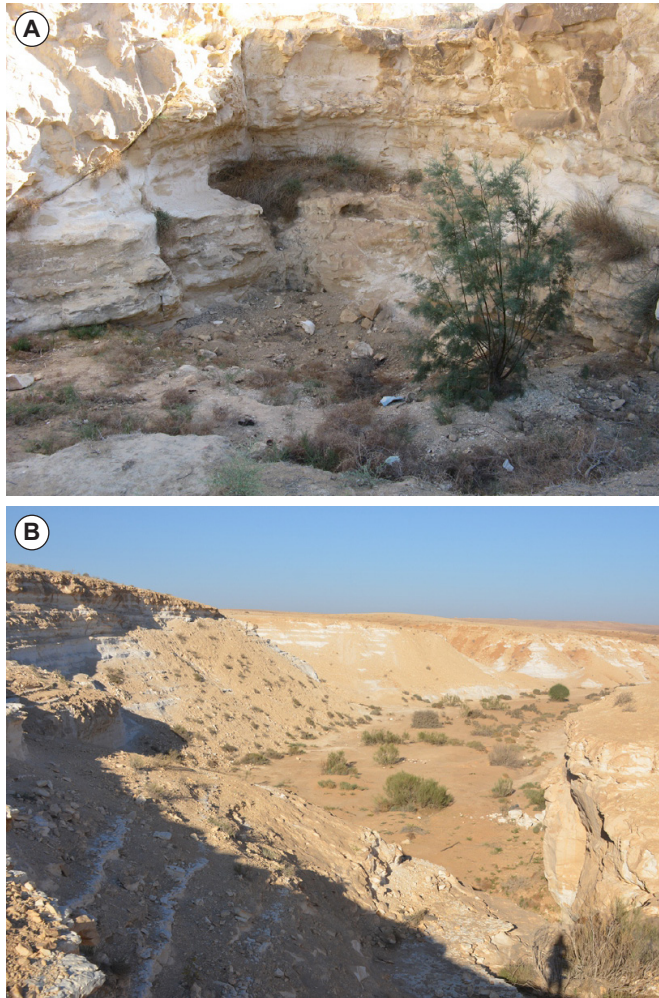


FIGURE 1. A. The microhabitat and B. general view of the habitat (bottom) where the *A. rueppellii* specimen was found, north of Shivta Junction, Israel. (photographs taken by DB).

These maps provide some interesting insights: first, the Shivta Junction individual indeed represents a new, hitherto unknown locality extension. The specimen was found ~25 km from the nearest known collection localities (in the East). While the locality is new, the habitat is similar to the one occupied by *A. rueppellii* in the Negev Mountains to the south (UR and SM, pers. obs.) – i.e., it was found in a relatively vegetated stream bed with limestone, sandy regosols and arid brown soils, rather than on sand. That said, the new locality is approximately 600 meters lower in elevation (~315m a.s.l.) than in the Negev Mountains, and thus may represent one of the warmest areas in the distribution of this species.

The global expert-drawn maps and specimen localities for the species do not always overlap. For example, the Israeli coastal plain is not included in the IUCN map but the species is represented from this locality in both HUJ collections and observations by BS. We therefore also predict, with Bar and Haimovitch (2012) that the species

may occur in the Gaza strip, for instance in association with leaf litter of *Ficus sycamora* trees, as has been observed in Nizzanim sands, southern Israeli coastal plain. The scarcity of specimens from the west bank, however, likely represents false absences, given the rarity of collecting and field surveys in the areas of the Palestinian Authority.

Several specimens, however, come from areas that do not appear on either the IUCN (Werner *et al.* 2006) or the recent Bar and Haimovitch (2012) map. The IUCN range excludes Lebanon and Syria, and so does Uetz (2012). Werner *et al.* (2006) however, acknowledge that “There is an unconfirmed record from southern Lebanon (not mapped here). There are currently no records from Syria, although it is possible that the species is present in this country”. Hraoui-Bloquet *et al.* (2002) identify Lebanese specimens of snake-eyed skinks as *A. budaki*, but acknowledges that old records (published before the resurrection of *A. rueppellii* by Schmidtler, 1997) cannot be confidently ascribed to either species. Three TAUM specimens (#13433, 14226 and 14227) are from Sidon, Lebanon, all taken during the 1982-1984 Lebanon war. Some of the authors view such specimens as the only positive outcome of this conflict. Given that it is widely distributed along the Israeli side of the Israel-Lebanon border, and that it occurs in Syria and the Northern Golan Heights (Figure 3), and because the S. Lebanese and SW Syrian habitats likely greatly resemble N. Israeli ones, we think it is extremely likely that *A. rueppellii* inhabits both countries. Further specimens (from all three sources) are reported from the lower Jordan Valley and from along the western shores of the Dead Sea, as far south as the Ein Gedi area. In view of the fact that several specimens are reported, from various sources, and because the region has many (small) springs and oases, usually on rocky soils, we think they represent genuine range extensions. In support of this, Disi *et al.* (2001) and Al-Quran (2009) report the species from adjacent areas in western and southern Jordan, respectively.

In the southern parts of its Israeli distribution, many sightings and specimens attest that *A. rueppellii* is found both further east (e.g., near Dimona, TAUM 13009) and further south than current maps (Werner *et al.* 2006; Bar and Haimovitch 2012) suggest. Again we view these data as reliable. Finally, the IUCN, as well as Baha El-Din (2006) report that *A. rueppellii* occurs in eastern Sinai. We suspect, however, that the exact location depicted in the species evaluation by the IUCN (Werner *et al.* 2006) should be moved a few kilometers to the south. As far as



FIGURE 2. *Ablepharus rueppellii*, Shivta Junction, TAUM specimen R16130. (photographs taken by Maria Novosolov).

we know, the only reliable data for the presence of the species in NW Sinai are in the form of a single specimen (HUJ 14337), collected in Qadesh Barnea (roughly 30°38' N, 34°26' E, Figure 3b) on October 1980. We verified the collection details with the collector, Henk Mienis (pers. comm. to SM) and view the locality record we present here as genuine.

In sum, *Ablepharus rueppellii* is widely distributed in Mediterranean areas of Israel, Syria and, most likely, Lebanon, and also penetrates the Israeli, Palestinian,

Jordanian and Egyptian desert where the right soils and humid microclimates exist. We are nonetheless puzzled by the ability of a tiny, diurnal skink to disperse to desert stream beds. One should bear in mind that *A. rueppellii*, a diminutive and secretive leaf-litter inhabitant, is likely to have been unintentionally dispersed into suitable habitats by humans. Whether its presence in isolated desert areas is natural or anthropogenic, or whether these may be relictual populations surviving since at least the last glacial, is yet to be revealed.

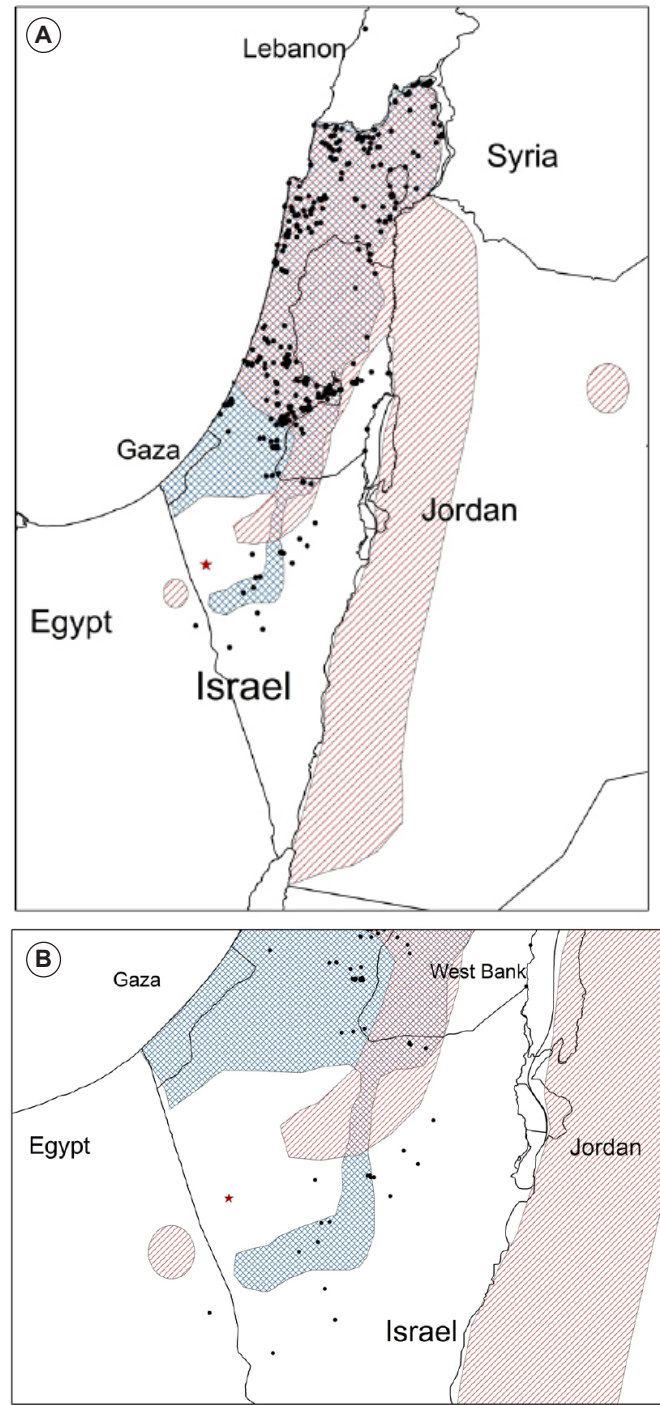


FIGURE 3. The distribution of Rueppel's Snake-eyed skink (*Ablepharus rueppellii*) in Israel and adjacent areas. A – Israel and adjacent areas. B – Negev Desert and adjacent areas. The Israeli distribution (from Bar and Haimovitch 2012) and the distribution according to the IUCN (Werner et al. 2006) are shown in blue hatching and red stripes, respectively. Black dots: museum and observation records (see above). Red star denotes the new specimen location.

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APPENDIX 1. A list of coordinates for collection localities or observations for the 812 skinks in our dataset. The data are arranged by latitude, from south to north. For each locality we list the number of specimens observed and/or collected there.

| Coordinates | Number of specimens /sightings |
|------------------|--------------------------------|
| 28.33N; 33.59E | 3 |
| 28.554N; 33.932E | 1 |
| 30.528N; 34.625E | 1 |
| 30.616N; 34.813E | 1 |
| 30.633N; 34.432E | 1 |
| 30.697N; 34.782E | 1 |
| 30.794N; 34.703E | 1 |
| 30.82N; 34.76E | 1 |
| 30.873N; 34.795E | 1 |
| 30.87N; 34.77E | 1 |

APPENDIX 1. CONTINUED.

| Coordinates | Number of specimens /sightings | Coordinates | Number of specimens /sightings |
|------------------|--------------------------------|------------------|--------------------------------|
| 30.941N; 34.979E | 1 | 31.642N; 34.917E | 1 |
| 30.983N; 34.751E | 3 | 31.642N; 34.935E | 3 |
| 30.994N; 34.91E | 1 | 31.642N; 34.936E | 2 |
| 30.995N; 34.918E | 1 | 31.642N; 34.937E | 1 |
| 30.99N; 34.92E | 2 | 31.642N; 34.938E | 3 |
| 30.99N; 34.93E | 2 | 31.643N; 34.935E | 2 |
| 31.025N; 35.064E | 1 | 31.643N; 34.936E | 7 |
| 31.06N; 35.02E | 1 | 31.643N; 34.937E | 9 |
| 31.14N; 35.11E | 2 | 31.644N; 34.921E | 1 |
| 31.329N; 35.088E | 1 | 31.645N; 34.916E | 1 |
| 31.338N; 35.041E | 1 | 31.646N; 34.914E | 1 |
| 31.343N; 35.038E | 1 | 31.647N; 34.911E | 1 |
| 31.34N; 35.036E | 1 | 31.647N; 34.913E | 1 |
| 31.369N; 34.83E | 2 | 31.649N; 34.857E | 1 |
| 31.372N; 34.866E | 1 | 31.64N; 34.91E | 1 |
| 31.38N; 34.9E | 1 | 31.64N; 34.92E | 1 |
| 31.491N; 35.394E | 1 | 31.64N; 34.96E | 1 |
| 31.507N; 34.868E | 1 | 31.656N; 34.937E | 3 |
| 31.507N; 34.871E | 1 | 31.65N; 34.91E | 5 |
| 31.507N; 34.87E | 2 | 31.65N; 34.92E | 1 |
| 31.507N; 34.888E | 1 | 31.66N; 34.92E | 1 |
| 31.507N; 34.895E | 2 | 31.66N; 34.99E | 3 |
| 31.507N; 34.896E | 2 | 31.671N; 34.566E | 1 |
| 31.508N; 34.869E | 2 | 31.67N; 34.95E | 2 |
| 31.508N; 34.87E | 6 | 31.683N; 34.973E | 1 |
| 31.508N; 34.885E | 1 | 31.68N; 34.98E | 1 |
| 31.508N; 34.886E | 3 | 31.694N; 35.052E | 1 |
| 31.509N; 34.869E | 1 | 31.695N; 35.05E | 1 |
| 31.509N; 34.871E | 1 | 31.695N; 35.063E | 1 |
| 31.509N; 34.887E | 1 | 31.695N; 35.069E | 1 |
| 31.511N; 34.863E | 1 | 31.695N; 35.078E | 1 |
| 31.511N; 34.872E | 7 | 31.696N; 35.068E | 1 |
| 31.511N; 34.87E | 2 | 31.696N; 35.069E | 3 |
| 31.511N; 34.887E | 1 | 31.696N; 35.081E | 1 |
| 31.512N; 34.893E | 2 | 31.697N; 35.068E | 1 |
| 31.512N; 34.894E | 1 | 31.698N; 35.073E | 1 |
| 31.513N; 34.893E | 4 | 31.698N; 35.077E | 1 |
| 31.51N; 34.869E | 1 | 31.698N; 35.081E | 1 |
| 31.51N; 34.872E | 2 | 31.698N; 35.082E | 2 |
| 31.51N; 34.87E | 1 | 31.699N; 35.074E | 1 |
| 31.51N; 34.886E | 3 | 31.699N; 35.078E | 1 |
| 31.51N; 34.888E | 1 | 31.69N; 35.04E | 1 |
| 31.537N; 34.857E | 1 | 31.6N; 35.03E | 1 |
| 31.541N; 34.889E | 1 | 31.709N; 35.072E | 1 |
| 31.552N; 34.791E | 1 | 31.709N; 35.075E | 1 |
| 31.553N; 34.792E | 1 | 31.715N; 34.59E | 1 |
| 31.553N; 34.815E | 1 | 31.716N; 34.588E | 1 |
| 31.554N; 34.813E | 1 | 31.716N; 34.605E | 1 |
| 31.577N; 35.038E | 1 | 31.717N; 34.893E | 1 |
| 31.584N; 34.61E | 1 | 31.719N; 34.625E | 2 |
| 31.599N; 35.408E | 2 | 31.719N; 34.626E | 2 |
| 31.621N; 34.887E | 1 | 31.71N; 34.96E | 1 |
| 31.621N; 34.888E | 1 | 31.71N; 34.97E | 1 |
| 31.622N; 34.886E | 1 | 31.71N; 35.45E | 1 |
| 31.62N; 34.887E | 1 | 31.721N; 34.622E | 3 |
| 31.62N; 34.92E | 3 | 31.721N; 34.626E | 1 |
| 31.62N; 35E | 4 | 31.721N; 34.627E | 1 |
| 31.63N; 34.94E | 1 | 31.722N; 34.625E | 1 |
| 31.641N; 34.936E | 1 | 31.723N; 34.614E | 1 |
| 31.641N; 34.937E | 5 | 31.723N; 34.623E | 2 |

APPENDIX 1. CONTINUED.

| Coordinates | Number of specimens /sightings | Coordinates | Number of specimens /sightings |
|------------------|--------------------------------|------------------|--------------------------------|
| 31.723N; 34.627E | 2 | 31.82N; 34.89E | 1 |
| 31.724N; 34.623E | 1 | 31.835N; 35.01E | 1 |
| 31.724N; 34.625E | 1 | 31.835N; 35.04E | 1 |
| 31.725N; 34.631E | 1 | 31.836N; 35.374E | 1 |
| 31.726N; 34.624E | 1 | 31.837N; 35.066E | 2 |
| 31.728N; 34.623E | 1 | 31.837N; 35.231E | 1 |
| 31.72N; 34.622E | 1 | 31.838N; 35.066E | 1 |
| 31.72N; 34.623E | 1 | 31.83N; 34.88E | 1 |
| 31.72N; 34.624E | 5 | 31.83N; 35.345E | 2 |
| 31.72N; 34.626E | 1 | 31.842N; 35.001E | 1 |
| 31.72N; 34.89E | 1 | 31.842N; 35.351E | 1 |
| 31.72N; 34.9E | 2 | 31.843N; 35.063E | 1 |
| 31.731N; 34.622E | 1 | 31.845N; 35.058E | 1 |
| 31.735N; 34.629E | 1 | 31.849N; 35.055E | 3 |
| 31.735N; 34.63E | 2 | 31.863N; 34.832E | 1 |
| 31.735N; 35.072E | 2 | 31.872N; 35.526E | 1 |
| 31.73N; 34.624E | 3 | 31.879N; 35.431E | 1 |
| 31.743N; 34.63E | 2 | 31.897N; 34.819E | 1 |
| 31.744N; 35.057E | 1 | 31.8N; 35.195E | 1 |
| 31.745N; 35.179E | 1 | 31.905N; 34.946E | 1 |
| 31.74N; 34.83E | 1 | 31.911N; 34.744E | 2 |
| 31.753N; 35.125E | 10 | 31.914N; 34.72E | 3 |
| 31.754N; 35.147E | 1 | 31.916N; 34.951E | 1 |
| 31.764N; 34.998E | 1 | 31.917N; 34.926E | 1 |
| 31.768N; 35.162E | 1 | 31.919N; 34.745E | 1 |
| 31.771N; 35.127E | 1 | 31.919N; 34.746E | 1 |
| 31.771N; 35.188E | 3 | 31.924N; 34.724E | 1 |
| 31.772N; 35.189E | 1 | 31.924N; 34.871E | 1 |
| 31.779N; 35.178E | 2 | 31.928N; 34.959E | 1 |
| 31.77N; 35.216E | 1 | 31.92N; 34.82E | 1 |
| 31.783N; 35.168E | 1 | 31.92N; 34.931E | 1 |
| 31.783N; 35.171E | 1 | 31.92N; 35.329E | 1 |
| 31.789N; 35.25E | 3 | 31.933N; 34.703E | 1 |
| 31.78N; 34.887E | 1 | 31.934N; 34.956E | 3 |
| 31.78N; 35.21E | 1 | 31.93N; 34.776E | 1 |
| 31.78N; 35.22E | 52 | 31.93N; 34.947E | 2 |
| 31.792N; 35.256E | 1 | 31.93N; 35E | 5 |
| 31.79N; 35.17E | 1 | 31.942N; 34.787E | 1 |
| 31.79N; 35.248E | 2 | 31.942N; 34.949E | 1 |
| 31.79N; 35.258E | 1 | 31.946N; 34.935E | 2 |
| 31.7N; 34.96E | 3 | 31.946N; 34.936E | 1 |
| 31.7N; 35.03E | 1 | 31.951N; 34.789E | 1 |
| 31.7N; 35.04E | 1 | 31.95N; 34.793E | 1 |
| 31.7N; 35.05E | 6 | 31.962N; 34.954E | 1 |
| 31.802N; 35.194E | 1 | 31.963N; 34.954E | 1 |
| 31.805N; 35.191E | 1 | 31.964N; 34.951E | 3 |
| 31.806N; 35.192E | 1 | 31.988N; 34.749E | 1 |
| 31.807N; 35.193E | 1 | 31.998N; 34.962E | 1 |
| 31.809N; 35.12E | 3 | 31.999N; 34.963E | 1 |
| 31.816N; 35.059E | 1 | 32.002N; 34.962E | 1 |
| 31.822N; 35.344E | 1 | 32.02N; 34.84E | 1 |
| 31.823N; 35.329E | 1 | 32.037N; 34.828E | 2 |
| 31.824N; 35.326E | 2 | 32.03N; 34.87E | 1 |
| 31.825N; 35.044E | 1 | 32.041N; 34.816E | 1 |
| 31.826N; 35.047E | 3 | 32.042N; 34.816E | 1 |
| 31.826N; 35.321E | 1 | 32.042N; 34.817E | 1 |
| 31.827N; 35.048E | 1 | 32.048N; 35.405E | 1 |
| 31.827N; 35.05E | 1 | 32.095N; 34.809E | 1 |
| 31.828N; 35.048E | 1 | 32.104N; 34.818E | 1 |
| 31.829N; 35.323E | 1 | 32.105N; 34.931E | 4 |

APPENDIX 1. CONTINUED.

| Coordinates | Number of specimens /sightings | Coordinates | Number of specimens /sightings |
|------------------|--------------------------------|------------------|--------------------------------|
| 32.29N; 35.34E | 1 | 32.61N; 35.141E | 5 |
| 32.362N; 35.454E | 1 | 32.621N; 35.477E | 1 |
| 32.371N; 34.936E | 1 | 32.628N; 35.541E | 1 |
| 32.371N; 34.943E | 5 | 32.641N; 35.539E | 1 |
| 32.372N; 34.934E | 1 | 32.644N; 35.054E | 1 |
| 32.375N; 34.92E | 1 | 32.646N; 34.992E | 1 |
| 32.376N; 34.922E | 1 | 32.646N; 35.002E | 1 |
| 32.38N; 34.914E | 1 | 32.647N; 34.99E | 2 |
| 32.401N; 34.879E | 1 | 32.649N; 35.008E | 1 |
| 32.409N; 34.885E | 1 | 32.64N; 35.539E | 1 |
| 32.411N; 34.885E | 4 | 32.654N; 35.085E | 1 |
| 32.412N; 34.876E | 1 | 32.65N; 35.01E | 1 |
| 32.412N; 34.879E | 1 | 32.669N; 34.978E | 1 |
| 32.412N; 34.881E | 3 | 32.669N; 35.04E | 1 |
| 32.415N; 34.874E | 2 | 32.671N; 34.973E | 1 |
| 32.415N; 34.886E | 1 | 32.671N; 35.04E | 3 |
| 32.416N; 34.887E | 2 | 32.672N; 35.087E | 1 |
| 32.424N; 35.422E | 1 | 32.67N; 34.978E | 1 |
| 32.425N; 34.877E | 1 | 32.67N; 35.08E | 3 |
| 32.456N; 35.428E | 1 | 32.683N; 35.094E | 1 |
| 32.457N; 35.423E | 1 | 32.687N; 34.97E | 1 |
| 32.471N; 34.921E | 1 | 32.689N; 35.5E | 1 |
| 32.48N; 35.36E | 3 | 32.68N; 35.15E | 1 |
| 32.494N; 34.93E | 1 | 32.68N; 35.57E | 1 |
| 32.501N; 34.89E | 3 | 32.69N; 34.93E | 1 |
| 32.501N; 35.419E | 1 | 32.69N; 35.39E | 1 |
| 32.502N; 35.418E | 1 | 32.708N; 35.576E | 2 |
| 32.538N; 35.349E | 1 | 32.71N; 35.1E | 1 |
| 32.539N; 35.002E | 1 | 32.721N; 35.143E | 3 |
| 32.541N; 34.95E | 3 | 32.722N; 35.341E | 2 |
| 32.542N; 34.95E | 1 | 32.722N; 35.344E | 1 |
| 32.543N; 34.937E | 1 | 32.723N; 35.345E | 1 |
| 32.543N; 34.939E | 2 | 32.725N; 35.344E | 1 |
| 32.544N; 34.937E | 1 | 32.726N; 35.129E | 1 |
| 32.544N; 34.939E | 1 | 32.727N; 35.022E | 1 |
| 32.549N; 34.939E | 2 | 32.727N; 35.149E | 1 |
| 32.549N; 34.941E | 5 | 32.728N; 35.338E | 1 |
| 32.549N; 34.942E | 2 | 32.72N; 35.14E | 4 |
| 32.551N; 34.939E | 1 | 32.732N; 35.005E | 2 |
| 32.551N; 34.942E | 1 | 32.736N; 35.165E | 1 |
| 32.553N; 34.944E | 1 | 32.736N; 35.552E | 2 |
| 32.553N; 34.946E | 1 | 32.73N; 35.15E | 4 |
| 32.556N; 34.954E | 1 | 32.73N; 35.17E | 1 |
| 32.558N; 34.952E | 2 | 32.73N; 35E | 4 |
| 32.559N; 34.945E | 1 | 32.741N; 35.162E | 2 |
| 32.559N; 34.947E | 1 | 32.741N; 35.164E | 1 |
| 32.55N; 34.941E | 2 | 32.741N; 35.546E | 1 |
| 32.55N; 34.942E | 3 | 32.742N; 35.549E | 1 |
| 32.564N; 35.088E | 1 | 32.748N; 35.549E | 2 |
| 32.566N; 35.487E | 1 | 32.74N; 35.07E | 1 |
| 32.569N; 35.02E | 3 | 32.776N; 35.696E | 1 |
| 32.574N; 34.954E | 4 | 32.784N; 35.636E | 2 |
| 32.586N; 35.07E | 4 | 32.788N; 35.015E | 1 |
| 32.589N; 35.004E | 1 | 32.79N; 35.54E | 1 |
| 32.599N; 35.002E | 2 | 32.805N; 34.955E | 4 |
| 32.606N; 35.116E | 2 | 32.825N; 35.257E | 1 |
| 32.612N; 35.51E | 1 | 32.856N; 35.261E | 1 |
| 32.613N; 35.516E | 1 | 32.869N; 35.543E | 1 |
| 32.619N; 34.955E | 2 | 32.883N; 35.631E | 1 |
| 32.619N; 35.513E | 1 | 32.885N; 35.445E | 1 |

APPENDIX 1. CONTINUED.

| Coordinates | Number of specimens /sightings | Coordinates | Number of specimens /sightings |
|------------------|--------------------------------|------------------|--------------------------------|
| 32.894N; 35.082E | 1 | 33.06N; 35.55E | 1 |
| 32.894N; 35.084E | 1 | 33.079N; 35.168E | 2 |
| 32.895N; 35.487E | 1 | 33.07N; 35.26E | 1 |
| 32.895N; 35.488E | 1 | 33.083N; 35.169E | 4 |
| 32.898N; 35.292E | 1 | 33.083N; 35.171E | 6 |
| 32.902N; 35.305E | 1 | 33.083N; 35.17E | 3 |
| 32.919N; 35.213E | 1 | 33.084N; 35.169E | 2 |
| 32.924N; 35.226E | 1 | 33.084N; 35.171E | 1 |
| 32.937N; 35.704E | 1 | 33.085N; 35.168E | 2 |
| 32.93N; 35.198E | 1 | 33.085N; 35.169E | 1 |
| 32.951N; 35.416E | 1 | 33.086N; 35.832E | 1 |
| 32.954N; 35.678E | 1 | 33.088N; 35.172E | 2 |
| 32.964N; 35.209E | 1 | 33.08N; 35.23E | 2 |
| 32.967N; 35.21E | 1 | 33.096N; 35.799E | 2 |
| 32.967N; 35.243E | 3 | 33.09N; 35.1E | 1 |
| 32.968N; 35.208E | 1 | 33.16N; 35.66E | 1 |
| 32.971N; 35.25E | 1 | 33.177N; 35.789E | 1 |
| 32.971N; 35.392E | 1 | 33.181N; 35.804E | 3 |
| 32.973N; 35.425E | 1 | 33.201N; 35.574E | 3 |
| 32.975N; 35.195E | 1 | 33.201N; 35.575E | 4 |
| 32.97N; 35.249E | 1 | 33.202N; 35.574E | 1 |
| 32.97N; 35.25E | 2 | 33.203N; 35.573E | 1 |
| 32.985N; 35.186E | 1 | 33.203N; 35.574E | 1 |
| 32.986N; 35.191E | 1 | 33.204N; 35.574E | 6 |
| 32.98N; 35.47E | 1 | 33.205N; 35.573E | 2 |
| 32.98N; 35.48E | 4 | 33.205N; 35.574E | 1 |
| 32.996N; 35.17E | 1 | 33.206N; 35.573E | 1 |
| 32N; 34.91E | 2 | 33.206N; 35.574E | 5 |
| 32N; 34.962E | 1 | 33.206N; 35.575E | 1 |
| 33.001N; 35.15E | 1 | 33.236N; 35.64E | 4 |
| 33.003N; 35.149E | 1 | 33.241N; 35.656E | 1 |
| 33.003N; 35.15E | 1 | 33.246N; 35.649E | 1 |
| 33.013N; 35.251E | 1 | 33.249N; 35.655E | 2 |
| 33.01N; 35.38E | 2 | 33.24N; 35.65E | 1 |
| 33.026N; 35.445E | 1 | 33.273N; 35.581E | 4 |
| 33.028N; 35.365E | 1 | 33.281N; 35.676E | 1 |
| 33.02N; 35.35E | 2 | 33.285N; 35.692E | 1 |
| 33.031N; 35.367E | 1 | 33.285N; 35.746E | 1 |
| 33.031N; 35.846E | 2 | 33.285N; 35.747E | 1 |
| 33.031N; 35.848E | 1 | 33.286N; 35.736E | 1 |
| 33.032N; 35.83E | 2 | 33.28N; 35.76E | 1 |
| 33.032N; 35.845E | 2 | 33.291N; 35.753E | 4 |
| 33.032N; 35.851E | 1 | 33.292N; 35.752E | 7 |
| 33.034N; 35.2E | 1 | 33.293N; 35.761E | 1 |
| 33.035N; 35.361E | 1 | 33.294N; 35.763E | 1 |
| 33.03N; 35.37E | 2 | 33.295N; 35.779E | 1 |
| 33.03N; 35.394E | 1 | 33.299N; 35.709E | 1 |
| 33.03N; 35.42E | 2 | 33.299N; 35.767E | 1 |
| 33.044N; 35.476E | 2 | 33.303N; 35.779E | 1 |
| 33.044N; 35.846E | 1 | 33.56N; 35.4E | 3 |
| 33.04N; 35.22E | 3 | 33N; 35.23E | 6 |
| 33.067N; 35.225E | 3 | 33N; 35.43E | 1 |
| 33.067N; 35.454E | 3 | 33N; 35.81E | 1 |