CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Fifteenth meeting of the Conference of the Parties
Doha (Qatar), 13-25 March 2010

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

To transfer the species *Uromastyx ornata* Heyden, 1827, currently listed in Appendix II, to Appendix I.

Uromastyx ornata, comprising the two subspecies *Uromastyx ornata ornata*, and *Uromastyx ornata philbyi* meets the qualifying biological criteria for Appendix I owing to the small size of some sub-populations, the species' limited distribution and the fragmentation of wild populations, an observed decline in the number of individuals in the wild population and the vulnerability of the population especially due to the species' late maturity and low fecundity, as well as an observed decline in the size of the population and in the quality of habitat due to anthropogenic and environmental factors. According to Resolution Conf. 9.24 (Rev. CoP14), Annex 1, the qualifying biological criteria are: Criteria A i) and v), Criteria B) iii) and iv) and Criteria C) i) and ii).

The species is clearly affected by trade according to definition ii) of this term in Resolution Conf. 9.24 (Rev. CoP14) due mainly to widespread misidentification and lack of proper documentation of international trade in this species, as well as very high demand for this attractive and colorful species (Figure 1), and reports of illegal collection from the wild, and reports of exports of wild-caught individuals from non-range state Parties.

B. Proponent

This proposal is presented by Israel, one of the four range states for this species*.

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* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

Figure 1. Bottom left: An adult male *Uromastyx ornata* in Egypt's Sinai Peninsula exhibits typical male coloration (see Section 3.4, below) (Photo by T. Wilms). Top right: an adult female *U. ornata* in the the Eilat Mountains Nature Reserve in southern Israel exhibits typical female coloration (see Section 3.4, below) (Photo by D. Molco from Sept. 2007). Bottom right: The same individual female photographed one year later in a dry *Acacia* tree appears thin and emaciated, apparently due to the severe drought ongoing in this area (see Section 4.1, below) (Photo by D. Molco from Sept. 2008).

C. Supporting statement

1. Taxonomy

1.1 Class: Reptilia

1.2 Order: Squamata

1.3 Family: Agamidae

1.4 Genus, species or subspecies, including author and year:

Uromastyx ornata Heyden, 1827 (which comprises 2 subspecies, *Uromastyx ornata ornata* and *Uromastyx ornata philbyi*).

1.5 Scientific synonyms:

The CITES standard reference for the genus *Uromastyx*, which is Wilms (2001), was designated for the first time by the 13th Conference of Parties in 2004 (see: CoP13 Doc. 9.3.1). This reference lists *Uromastyx ornata* as a separate species, but prior to this, the species *U. ornata* was not listed in the CITES checklist at all, but was usually deemed a subspecies of *U. ocellata* and traded under this name. In the scientific literature the species has quite a number of synonyms, as listed in Annex 1 of this proposal.

1.6 Common names: English: Ornate spiny-tailed lizard, Ornate Dabb-lizard, Ornate mastigure
French:
Spanish:

1.7 Code numbers: The species is not presently included in the CITES Identification Manual. Israel offers to prepare the identification sheet for this species in the near future.

2. Overview

The purpose of this proposal is to transfer the species *Uromastyx ornata* from CITES Appendix II to Appendix I. The main reason is to better protect the wild populations of this species which are fragmented and in decline due to ongoing illegal collection and trade, as well as environmental factors (such as climate change, severe drought, and overgrazing by domestic livestock), and the species' intrinsic factors (late maturity, low fecundity, low juvenile survival) which greatly limit its ability to withstand illegal collection and changes to its fragile desert habitat, and also to ensure proper identification and record-keeping of international trade in this species.

This attractive species is in very high demand as live animals for the pet trade, especially in North America, Western Europe and Japan. Trade records for this species show great discrepancies; for example, although all four range states for this species have no export quotas, hundreds of wild-caught *Uromastyx ornata* are reported as being exported annually from Parties that are not range states for this species. In addition, trade records show that hundreds of farmed (source code F) and captive-bred (source code C) *U. ornata* were imported from countries not reporting matching exports or having records of having imported them to establish captive breeding facilities. The source of all these declared wild-caught and captive-bred specimens in documented international trade is unclear.

Part of the reason for these discrepancies is apparently due to misidentification, as this species was not listed in the CITES checklists before 2004, even though the genus *Uromastyx* has been listed in Appendix II since 1977. At the 13th Conference of the Parties in October 2004, a standard reference for the taxonomy of the genus *Uromastyx* was chosen for the first time, and it listed *U. ornata* as a separate species. Prior to this, most Parties simply considered them as a subspecies of *U. ocellata*. Therefore, much of the trade data before 2004 are unavailable for this species as reports of *U. ocellata* in trade apparently also included specimens of *U. ornata*. Misidentification of this species in export permits is apparently still going on, so better identification is needed to protect the wild populations.

The species *U. ornata* was bypassed by the Significant Trade Review process even though the genus *Uromastyx* was chosen for the process by the Animals Committee at AC 20 in April 2004. This is because AC20 Doc. 8.5, Annex C did not include *U. ornata* in the list of proposed species, as it was not included in the CITES checklist until after CoP 13, which was later that same year. Therefore, no detailed report about *U. ornata* was presented with those of the other *Uromastyx* species at AC 22 in 2006 (see: AC22 Doc 10.2 and its Annexes).

As mentioned above, none of the four range states for this species show any recent exports of this species so establishing zero quotas would not be enough. What is needed is an Appendix-I listing to ensure proper documentation of all legal trade, and to make illegal collection and international trade more difficult.

3. Species characteristics

3.1 Distribution

Uromastyx ornata is endemic to the Arabo-Sinaian region and occurs now in four countries: Egypt, Israel, Saudi Arabia and Yemen. The distribution has apparently shrunk compared to its historical distribution (which may have included arid regions of Jordan and Syria), and is now fragmented, with subpopulations being separated by mountain ranges and water bodies. Two subspecies have been identified (Wilms et al., 2009): *U. ornata ornata* which occurs in southern Israel, the Sinai Peninsula of Egypt, and north-western Saudi-Arabia; and *U. ornata philbyi* which occurs in south-western Saudi-Arabia and north-western Yemen (Arnold, 1986; Schaetti, 1989; Bouskila & Amitai, 2001; Baha el Din, 2006; Wilms & Böhme, 2007; AbuZinada, undated).

3.2 Habitat

Uromastyx ornata lives in very dry extreme desert conditions with < 20 mm mean annual rainfall, in rocky habitats rich in holes and crevices. In Israel it occurs only in steep, rocky, hot wadis that hold *Acacia* trees and *Ochradenus baccatus* bushes (Mendelssohn & Bouskila, 1989; Bouskila & Amitai 2001, Molco & Ben-David 2000).

3.3 Biological characteristics

Very little has been published about the ecology and behavior of *Uromastyx ornata* in the wild; most of what is presented here is from unpublished surveys and reports of the Israel Nature and Parks Authority.

Uromastyx ornata are heliothermic (they maintain a internal high body temperature), and because of the very high air and soil temperatures in their habitat, the individuals can maintain a near homoeothermic condition (i.e. a constant body temperature) of 38-41°C while in and out of the den (Mendelssohn & Bouskila, 1989). They are most active during the hottest part of the day during the hottest months. Most activity is on rocky slopes of wadis (dry river-beds) where they shelter in crevices and cracks in the rock, with occasional descents to the floor of the wadi, e.g. for feeding or reproduction (including courtship and nesting).

Dominant males attack and chase other males from their home range, but they do not maintain exclusive territories. Often a dominant male occupies a segment of the slope in a wadi where several females, and even a subordinate male, may use the same area. The female digs a burrow in the floor of the wadi, where she lays a clutch of 7-17 eggs in June. The eggs hatch after about 60 days in early August. Juveniles disperse within 4 days after hatching. Rates of juvenile survivability in the wild have not been recorded but are presumed to be low. In nature, the growth rate is very slow (see Annex 2 of this proposal), with juveniles reaching sexual maturity at the age of 4.5 years (Molco & Ben-David, 2000). This is in contrast to reports by captive-breeders of sexual maturity in captivity at about 1 year old.

The food of *Uromastyx ornata* is mainly composed of flowers, fruits and leaves of desert plants such as *Ochradenus baccatus* and other non-halophytous perennials. *U. ornata* shelter in rock crevices on steep slopes of wadis, but they descend the slopes for feeding in the wadi and for reproduction (Bouskila & Amitai 2001; Molco & Ben-David, 2000; Bouskila & Molco, pers. comm.).

According to Mendelssohn & Bouskila (1989) *Uromastyx ornata* hibernate in Israel from December to February, but Molco & Ben David (2000) reported activity year-round, although less in winter months.

3.4 Morphological characteristics

Uromastyx ornata is a medium-sized lizard species in the genus *Uromastyx* with adults reaching a total length (including the tail) of up to 40 cm and weighing up to 300 g (Mendelssohn & Bouskila, 1989). They show the general *Uromastyx* body plan of broad flattened body and strongly spiny tail; females are as large as, or larger than males. They are sexually dichromatic; males are greenish, blue or red, with an irregularly reddish brown net-like pattern and yellow spots on the back; sometimes yellow cross-bands are present and the ventrum (abdomen) has a dark pattern (see photos on Page 1 of this proposal). Females are not as colorful as males; they are light brown with dark brown spots and sometimes light yellow spots; the ventrum is yellowish or white, without a pattern (Knapp, 2004; Wilms & Böhme, 2007, Wilms et al., 2009). The colors within the species are variable and they can even fluctuate within an individual at different times of day, as color change is used for thermoregulation (Mendelssohn & Bouskila, 1989).

According to the identification key of Wilms et al. (2009), the two subspecies of *Uromastyx ornata* can be distinguished morphologically by the ratio of tail length to maximum tail width at the 5th whorl; the ratio is between 3.61 and 5.30 for *U. ornata ornata*, and is between 3.03 and 3.96 for *U. ornata philbyi*. In other words, the tail of *U. ornata philpyi* is shorter and fatter than the tail of *U. ornata ornata*.

Two characters can assist in distinguishing *Uromastyx ornata* morphologically from its sister species *Uromastyx ocellata*. While *U. ornata* has enlarged scales on the anterior border of the ear opening, these are not enlarged in *U. ocellata*, which has generally smaller scales than *U. ornata* (Wilms et al., 2009); *U. ornata* has yellow dorsal spots and bars which may be very pale and faint but always yellow, while these are always white to very pale cream to none at all in *U. ocellata*; the difference in color is subtle when they are hatchlings, but still present (D. Dix, pers. comm.).

3.5 Role of the species in its ecosystem

The role of *Uromastyx ornata* in its ecosystem has not been studied directly, but it is reasonable to view it as similar to that of other *Uromastyx* species that serve as important ecosystem engineers in their fragile and harsh arid environments. *U. ornata* is probably less of an ecosystem engineer than other *Uromastyx* species, in that it does not create large burrows in the hard desert floor, but it does dig nesting burrows for laying eggs and it often clears spaces to create burrows within rocky crevices, and these are apparently exploited by many other species.

The species serves as occasional prey to desert predators, such as carnivores and raptors; Geffen et al. (1992) documented predation of *U. ornata* by Blanford's foxes, *Vulpes cana*, in southern Israel.

4. Status and trends

4.1 Habitat trends

As mentioned above (in section 3.2), *Uromastyx ornata* is adapted to very dry extreme desert where it feeds on desert vegetation. In the species' habitat in the south of Israel an extreme drought for the past nine years (Shlomi & Ginat, 2009) has caused considerable decline in desert plants and consequently a decline in the number of *U. ornata* in this area (see also Figure 1 on the first page of this proposal). This decline in rainfall in Israel is apparently related to global climate change and is likely to continue in Israel in the future (Golan-Angleko & Bar-Or, 2008) and probably in the other range states as well.

4.2 Population size

The population status of *Uromastyx ornata* in the wild is unknown and undocumented. In southern Israel there are probably no more than a few hundred individuals left now, as opposed to a few thousand that were there in 2000 (Molco, pers. comm.). Surveys in the eastern Sinai Peninsula in 1988-9 by an INPA ranger showed reduced populations compared to some 20 years earlier, but these were not quantified.

4.3 Population structure

As mentioned above, very little has been published about the ecology and behavior of *Uromastyx ornata* in the wild, and most of what is presented here is from unpublished surveys and reports of the Israel Nature and Parks Authority. *U. ornata* may be solitary or live in small groups, but never with more than one adult male (Mendelssohn & Bouskila, 1989). Molco & Ben-David (2000) observed in southern Israel about 15 individuals per km², or about 30 individuals per 1 km length of a wadi supporting rich perennial vegetation, but they gave no details about age structure or the presence of juveniles.

4.4 Population trends

IUCN's (2004) preliminary global assessment of *Uromastyx ornata* states that the species is in decline and that it is "moderately abundant in suitable habitat, but populations appear to significantly fluctuate. The species is declining from heavily disturbed and accessible areas of their range."

Some subpopulations have declined drastically, as was observed in a survey of Mt. Timna in southern Israel by the Israel Nature & Parks Authority; in 1998 no *U. ornata* were seen in areas where they had been observed several years earlier (Bouskila & Molco, 2002). The current status of the population in the Eilat Mountains Nature reserves in southern Israel shows major declines over the past few years. The cause of these declines is apparently diminished vegetation due to severe drought.

Similarly, five surveys were conducted by INPA rangers in 1998 and 1999 in the eastern Sinai Peninsula of Egypt in areas where the species was abundant some 15-20 years earlier. The purpose of the surveys was to compare the status of the *U. ornata* population with what it was in the 1970's and 1980's when the area had been a nature reserve while under control by Israel (the Sinai Peninsula was turned over from Israel to Egypt in the early 1980's in accordance with the 1979 peace treaty between these two countries). The surveys found far fewer *U. ornata* and much less plant life. Egyptian officials on site attributed the decline in *U. ornata* to illegal over-collection, and to over-grazing of the desert plants by domestic livestock, mainly goats and camels (D. Molco, pers. comm.).

4.5 Geographic trends

As mentioned in Sections 3.2 and 4.1 above, southern Israel has been experiencing severe drought for about 9 years, apparently due to climate change (Shlomi & Ginat, 2009). This has caused lower ground-water levels and a great reduction in the availability of perennial vegetation in *Uromastyx ornata*'s habitat.

5. Threats

The main direct human-induced threats include illegal collection, but also disturbance of the fragile desert habitat by all-terrain vehicles (which damage plants and leave deep tread marks that affect water run-off to the plants), and by over-grazing by domestic livestock (mainly goats and camels). *Uromastyx* lizards are collected for traditional medicine and for bushmeat, and their meat and skins are sold in many north-African and near-eastern countries; it is unclear if *U. ornata* is utilized in this way, but it is certainly collected for the pet trade.

IUCN's (2004) preliminary global assessment of *Uromastyx ornata* states that this species "is affected by over-collection for the international pet trade, including the illegal collection of animals within protected areas (Egypt). It is also threatened by loss of habitat due to tourist activities (such as off-road vehicles), cutting of *Acacia* for charcoal, quarrying and military developments." Israel's Red Book (Dolev & Perevolotsky, 2004) lists the local population of *U. ornata* as Endangered due to three major threats: collection potential for the pet trade, vehicle damage to desert shrubs, and disturbance of feeding by vehicles and hikers.

The eastern Sinai Peninsula of Egypt has experienced an extensive and rapid expansion of tourist sites over the past 25 years, leading to loss of habitat due to quarrying and tourist activity in *U. ornata* habitat.

6. Utilization and trade

6.1 National utilization

As mentioned above, many *Uromastyx* lizards are collected as bushmeat and some are used for traditional medicines. For example, AbuZinada (undated) reported high levels of capture and trade of *U. aegyptia* in Saudi Arabia where it is considered a delicacy. *U. ornata* is not exploited for bushmeat in Israel or Saudi Arabia, but may be in Yemen and Egypt.

6.2 Legal trade

Uromastyx ornata is an attractive and colourful species (see Figure 1 on page 1 of this proposal), and it is in high demand in the pet trade. It is considered as very expensive and desirable by collectors and breeders (see Annex 3 of this proposal).

Auliya (2003) and Knapp (2004) reviewed trends in *Uromastyx* trade stressing the role of the EU. In addition, analyses of global trade in *Uromastyx* were presented by UNEP-WCMC at the 20th meeting of the Animals Committee in Johannesburg in 2004 (as: AC20 Doc 8.5 Annex C), and by IUCN at the 22nd AC meeting in Peru in 2006 (as: AC22 Doc. 10.2 Annexes 6a-6e) as part of the Review of Significant Trade in Appendix-II species. All these point to the fact that there is very high demand for *Uromastyx* species, much illegal collection and trade, combined with local population declines.

Trade data for *Uromastyx ornata* from the WCMC-UNEP database are provided in Annex 4 of this proposal. As mentioned above, this species was first included in the CITES checklist in 2004. Prior to this, it was usually considered a subspecies of *Uromastyx ocellata*. Our review of the trade data show that there was much confusion over identification of *U. ornata* as there were many exports reported from non-range states. Similarly there were wild-caught specimens in trade whose source is unclear, even in recent years in which none of the four range states officially allowed export.

From these data it is difficult to learn now how much trade in *U. ocellata* prior to 2004 was actually in *U. ornata*. Egypt is the only country which is a range state for both species, and they have had no reported exports of either species since 1995. It seems likely that specimens of wild-caught *U. ornata* reported as exports by Sudan were actually *U. ocellata*, as Sudan is a range state for the latter and not the former, but Sudan also reported export of thousands of *U. ocellata* during these years (see AC22 Doc. 10.2 Annex 6e for details of trade in *U. ocellata* from 1994-2003) so it is unclear why some were designated as *U. ornata*.

All these point to the need for an Appendix-I listing for better protection of the wild populations to enable Parties to monitor and control their trade and possession once they have been removed from the wild.

6.3 Parts and derivatives in trade

There are traditional medicines made from some *Uromastyx* species for domestic use in the near-east and North Africa, but it is unclear if *Uromastyx ornata* is used for this. All the reported international trade of *Uromastyx ornata* since 1999 consists of live individuals (except for 2 cases of trade in "bodies"). There is great domestic demand for the meat and skins of *Uromastyx* lizards and they are sold as bushmeat in local markets, although it is unclear if *U. ornata* are used in this way.

6.4 Illegal trade

Illegal international trade is always difficult to quantify. In this case it is especially difficult because of problems of identification. The expected benefit of transferring *Uromastyx ornata* to Appendix I is to control commercial trade in this species and to increase awareness of this species among CITES Authorities and

the customs agents at border crossings, as well as to enable Parties to effectively stop illegal imports and trade in their jurisdiction, and thus help reduce and eliminate demand for this species driving illegal trade and exploitation to the detriment of the wild populations.

6.5 Actual or potential trade impacts

Due to the low fecundity and juvenile survival rates of this species and the vulnerability and fragility of its desert habitat, the uncontrolled and unsustainable collection and trade will clearly lead to further declines of local populations.

According to UNEP-WCMC (2004), the death rate for *Uromastyx ornata* is apparently as high as 80% during the first two months of captivity.

7. Legal instruments

7.1 National

Uromastyx ornata is legally protected in Israel by the Wildlife Protection Law of 1955 (and its regulations) and by the National Parks, Nature Reserves and National Monuments Law of 1998 (and its regulations). The Israeli population's habitat is within a declared nature reserve. In Egypt they are apparently fully protected by law and they reportedly occur in five nature reserves (IUCN, 2004). Their legal status in Yemen and Saudi Arabia is unclear.

7.2 International

All species of *Uromastyx* were listed in CITES Appendix II in 1977. There are currently no export quotas for *Uromastyx ornata* from any of the four range states.

All *Uromastyx* species are listed in Annex B of the European Wildlife Trade Regulations (see: Commission Regulation No. 407/2009 of 14 May 2009 amending Council Regulation No. 338/97).

8. Species management

8.1 Management measures

We are unaware of any management programs for this species.

8.2 Population monitoring

The Israeli population of *Uromastyx ornata* was monitored systematically for four years (1996 – 1999) by observational transects in wadis with known populations. Details were summarized by Molco & Ben-David (2000). Since then there have been periodic observations of this population. We are unaware of any other monitoring programs for this species.

8.3 Control measures

8.3.1 International

None

8.3.2 Domestic

We are unaware of any domestic programs for sustainable harvest of *Uromastyx ornata* from the wild.

8.4 Captive breeding and artificial propagation

According to the trade records (see Annex 4 of this proposal) there has been commercial captive breeding of this species in recent years in USA, Ukraine, Jordan and Turkey. But even this is not clear as some of these reports of import have no matching export records. There is no captive breeding of *Uromastyx ornata* in Israel.

8.5 Habitat conservation

In Israel, off-road vehicles have been restricted from many of the wadis in the south where *Uromastyx ornata* occur. Due to the extreme drought in southern Israel (Shlomi & Ginat, 2009), the Israel Nature and Parks Authority has examined the possibility of watering desert plants in order to improve food availability for *U. ornata*, but this could lead to possible changes to the distribution of other species of wildlife as well as increasing the risk of *U. ornata* becoming dependent on human-augmented food sources. As of Sept. 2009, this program has not been approved.

We are unaware of habitat conservation programs in the other range states.

8.6 Safeguards

Not relevant.

9. Information on similar species

See Section 3.4, above, for details on distinguishing between *Uromastyx ornata* and its sister species *Uromastyx ocellata*. See Wilms et al. (2009) for differential diagnosis details and a new detailed key for all species of *Uromastyx*. Israel has offered to prepare the identification sheet for this species for the CITES Identification Manual.

10. Consultations

Range States: Israel's Scientific Authority sent an initial proposal and request for information by e-mail to the Scientific Authority of Egypt in December 2008 but received no response. Israel sent the draft proposal to the Secretariat on 16 July 2009 with a request to forward it to the other three range states: Egypt, Saudi Arabia and Yemen. The Secretariat sent it out as Notification 2009/031 to all CITES Parties on 27 July 2009, but then withdrew this Notification on 5 August 2009, and requested that Israel send the draft proposal directly to the other range states. On 9 Aug 2009 the Israeli Scientific Authority sent the draft proposal by e-mail to the Scientific and Management Authorities of Egypt, Saudi Arabia and Yemen (using e-mail addresses listed on the CITES web site). Our system reported the e-mails as delivered, but we received no responses as of 30 Sept. 2009.

Syria: In the past, the WCMC-UNEP species database listed Syria as a possible range state for *Uromastyx ornata*. At Israel's request, WCMC-UNEP contacted Syria in Nov 2008 which responded that this species does not occur in Syria, and WCMC-UNEP then removed Syria from the list of range states.

Jordan: The trade data (see Table 4 in Annex 4 of this proposal) shows exports of hundreds of wild-caught individuals of *Uromastyx ornata* from Jordan in 2005 and 2006. Jordan responded to Israel's request for clarification by stating that these were reported as being wild-caught (source code W) due to a clerical error, and they were in fact captive-bred and should have been reported with source code C.

11. Additional remarks

None.

12. References

AbuZinada, A.H. (Chief Editor) (undated). First Saudi Arabian National Report on the Convention on Biological Diversity. The National Commission for Wildlife Conservation and Development, Riyadh.

Auliya, M. (2003). Hot trade in cool creatures: A review of the live reptile trade in the European Union in the 1990s with a focus on Germany. TRAFFIC Europe, Brussels, Belgium.

Baha el Din, S. (2006). Guide to the Reptiles and Amphibians of Egypt. American University in Cairo Press.

Arnold, E.N. (1986). A key and annotated check-list to the lizards and amphibians of Arabia. Fauna of Saudi Arabia 8: 385-435.

Bouskila A. & P. Amitai (2001). Handbook of Amphibians & Reptiles of Israel. Keter Publishing, Jerusalem, Israel [in Hebrew].

Bouskila A. & D. Molco (2002). Status of Spiny-tailed lizards (*Uromastyx* spp.) in Israel. Unpublished report for the Israel Nature and Parks Authority [in Hebrew].

Dolev A. & A. Perevolotsky (2004). The Red Book of Vertebrates in Israel. Israel Nature and Parks Authority & the Society for Protection of Nature in Israel.

Geffen, E., R. Hefner, D.W. MacDonald & M. Ucko (1992). Diet and foraging behavior of Blanford's foxes, *Vulpes cana*, in Israel . Journal of Mammalogy, Vol. 73: 395-402.

Golan-Angleko, I & Y. Bar-Or (2008). Israel's Adaptation to Climate Change - Impacts and Recommendations. Report of the Chief Scientist, Ministry of Environmental Protection, Jerusalem, Israel [in Hebrew].

IUCN (2004). *Uromastyx ornata.* Preliminary global species assessment sheet. Assessed 17 December 2004.

Knapp, A. (2004). An Assessment of the International Trade in Spiny-tailed Lizards *Uromastyx* with a focus on the Role of the European Union. TRAFFIC Europe. European Commission, Brussels, Belgium.

Mendelssohn, H. & A. Bouskila (1989). Comparative ecology of *Uromastyx aegyptius* and *Uromastyx ornatus* in Southern Israel and Southern Sinai. Pg. 101 *in*: Abstracts of the First World Congress of Herpetology, Univ. of Kent, Canterbury, UK.

Molco, D. & O. Ben-David (2000). The ecology and biology of *Uromastyx ornatus*, summing-up 4 years of observations (1996 - 1999). Unpublished report of the Israel Nature and Parks Authority [in Hebrew].

Schaetti, B. (1989). Amphibians and reptiles from North Yemen and Djibouti. Revue Suisse de Zoologie, v.96, n.4, 1989:905-938 [in German].

Shlomi, Y. & H. Ginat (2009). Rainfall in the Arava Valley (1950 – 2008), First Report; Presented to the Water Authority and the Arava Drainage Authority by the Dead Sea & Arava Science Center [in Hebrew].

UNEP-WCMC (2004). Review of Significant Trade: Analysis of Trade Trends with Notes on the Conservation Status of Selected Species, Annex C: Reptiles and Amphibians. Prepared for the CITES Animals Committee, CITES Secretariat by the United Nations Environment Programme - World Conservation Monitoring Centre, Switzerland. Presented at the 20th Animals Committee Meeting as: AC20 Doc. 8.5 Annex C.

Wilms, T. (2001). Dornschwanzagamen: Lebensweise, Pflege und Zucht. Herpeton, Verlag Elke Köhler, Offenbach [in German].

Wilms, T. & W. Böhme (2007). Review of the taxonomy of the spiny-tailed lizards of Arabia (Reptilia: Agamidae: Leiolepidinae: *Uromastyx*). Fauna of Arabia 23: 435–468.

Wilms, T, W. Böhme, P. Wagner, N. Lutzmann & A. Schmitz (2009). On the phylogeny and taxonomy of the genus *Uromastyx* Merrem, 1820 (Reptilia: Squamata: Agamidae: Uromastycinae) - resurrection of the genus *Saara* Gray, 1845. Bonner Zoologische Beiträge 56:55-99.

Scientific synonyms

The CITES standard reference for the genus *Uromastyx*, Wilms (2001) lists *Uromastyx ornata* with two subspecies: *Uromastyx ornata ornata* and *Uromastyx ornata philbyi*. Both these subspecies have a variety of synonyms in the scientific literature, as follows:

Synonyms of *Uromastyx ornata ornata*

Uromastyx ornata Heyden 1827
Uromastix ornatus Duméril & Bibron 1837
Uromastix ornatus Boulenger 1885
Uromastyx ornatus Wermuth 1967
Uromastyx ocellatus ornatus Arnold 1986
Uromastyx ocellata ornata Wilms 1995
Uromastyx ornata ornata Wilms 2001
Uromastyx ocellata ornata Wilms 2002

Synonyms of *Uromastyx ornata philbyi*

Uromastyx ornata Wilms 2002
Uromastyx ornata philbyi Parker 1938
Uromastyx philbyi Parker 1938
Uromastyx philbyi Wermuth 1967
Uromastyx ocellata philbyi Joger 1987
Uromastyx philbyi Zari 1999
Uromastyx ornata philbyi Wilms 2001
Uromastyx ornata philbyi Wilms 2007

Growth rate in the wild

Ben-David and Molco (1999) tracked changes in weight (mass) and total length (from snout to tail's tip) of individual *Uromastyx ornata* in the wild in southern Israel. Their data are presented in Table 2; these differ greatly from growth rates in captivity where adult size and sexual maturity are reached after approximately 1 year.

Table 1. Growth, as measured by changes in mass and TL (total length), of wild *Uromastyx ornata* in southern Israel (data from Ben-David & Molco, 1999).

Age	*Weight (grams)*	*Total length (mm)*
Hatchlings	5	85 - 95
One year	22 -32	150 - 175
Two years	50	213
Three years	98 -116	247 - 266
Four years (adult size)	> 180	> 275

Some recent quotes from the internet on trade in *Uromastyx ornata*

1. Today a few Ornates still enter North America as hatchlings from Europe or suspect "ranched" from Egypt, but a notable number of specimens currently produced by a handful of U.S. breeders. The limited numbers available coupled with high demand have generally kept the price for hatchlings to be around $200 with premium adults bringing appreciably more. Source: http://www.deerfernfarms.com/Uromastyx_Ornate.htm (accessed 17 May 2009)

2. Ornate uros, are found in Egypt, Israel, & Saudi Arabia and are currently one of the most sought out lizards in the herp industry, due to their obvious beauty, small size and calm nature. Captive breeding has proved difficult and few specimens are readily available. Females are … more sought after by breeders. Source: http://www.kingsnake.com/uromastyx/urocaresheet.html (accessed 17 May 2009)

3. Now accepting advance orders for CB [captive-bred] 2009 Ornate Uromastyx - $225. Source: http://www.urotopia.com (accessed 13 July 2009)

4. Ornate Uromastyx: The most beautiful of the lizards described here, these are the most expensive. They are also one of the most popular, and they sport a brilliant range of colors. They look very similar to the Ocellated Uromastyx, and their only feature that sets them apart are the enlarged, tooth-like scales (denticulate scales) at the middle of the row to the front of the ear opening. Source: http://www.wikihow.com/Care-for-Uromastyx-Lizards (accessed 13 July 2009)

Trade data analysis

This analysis is based on all reports downloaded from the UNEP-WCMC Trade Database on 10 May 2009 for trade in live specimens of *U. ornata* where the purpose of trade was designated with Purpose Code "T" (i.e., commercial trade), for nine years: 1999 to 2007. It is important to note that the species *U. ornata* was not in the CITES checklist prior to 2004. Also, the species has only four range states: Egypt, Israel, Saudi Arabia and Yemen. For a discussion of this analysis see Section 6.2, above.

The data are presented in two parts: Part 1 is based on data from the annual reports of the exporting parties; Part 2 is based on data from the annual reports of the importing parties. The Parties are designated by their two-letter ISO code and their name.

The following are the descriptions of the three Source Codes that appear in the tables in this Annex, as they appear in Resolution Conf. 12.3 (Rev. CoP14):

W Specimens taken from the wild.
C Animals bred in captivity in accordance with Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof, exported under the provisions of Article VII, paragraph 5 (specimens of species included in Appendix I that have been bred in captivity for non-commercial purposes and specimens of species included in Appendices II and III).
F Animals born in captivity (F1 or subsequent generations) that do not fulfil the definition of 'bred in captivity' in Resolution Conf. 10.16 (Rev.), as well as parts and derivatives thereof

Part 1. Data from Annual Reports by Exporting Parties

Table 2. Source and quantity of annual exports (commercial trade) of live *U. ornata*, as reported by the exporting countries. The country of origin (the second column from the left) is given only for re-export permits and is blank for direct export.

Exporter reporting	Origin (only in re-export permits)	Source Code in export permits	1999	2000	2001	2002	2003	2004	2005	2006	2007	Grand Total
CA Canada	UA Ukraine	C							84	12		96
DE Germany	ES Spain	C	4									4
ID Indonesia	UA Ukraine	C					200					200
JO Jordan		C						1,140				1,140
JP Japan	SD Sudan	W				100						100
LY Libya		W								400		400
RU Russia	UA Ukraine	F	420	2,080								2,500
SD Sudan		W	200	1,660	560	700						3,120
SY Syria		C									400	400
UA Ukraine		C		102	200	200	2,942	2,082	1,924	720		8,170
UA Ukraine		F		620	400	1,000	1,534					3,554
US United States	JO Jordan	C									8	8
US United States	LB Lebanon	W				8						8
US United States	UA Ukraine	C							40			40
US United States	YE Yemen	W	8									8
YE Yemen		W	794									794
ZA South Africa	SD Sudan	W			300							300
Grand Total			**1,426**	**4,462**	**1,460**	**2,008**	**4,676**	**3,222**	**2,048**	**1,132**	**408**	**20,842**

Part 2. Data on trade in live *Uromastyx ornata* from Annual Reports submitted by Importing Parties

Table 3. Total quantity of live *Uromastyx ornata* imported annually (commercial trade), as reported by the importing country.

Importer reporting	1999	2000	2001	2002	2003	2004	2005	2006	2007	Grand Total
CA Canada		400		8	110	112	240	150		1,020
DE Germany		200								200
FR France		300	100	100	1,200	30				1,730
HK Hong Kong								80	20	100
ID Indonesia					350				20	370
IT Italy								60		60
JO Jordan				1,000						1,000
JP Japan		200		300	244	12	704	620		2,080
KR Republic of Korea								12		12
MX Mexico								80		80
MY Malaysia								60		60
PT Portugal						2				2
SE Sweden					20	40				60
US United States	790	400		110	2,180	800	1,266	1,164	740	7,450
ZA South Africa			300							300
Grand Total	**790**	**1,500**	**400**	**1,518**	**4,104**	**996**	**2,210**	**2,226**	**780**	**14,524**

Table 4. Source of commercial trade in live *Uromastyx ornata* as reported by the importing countries annually (Tables 4 and 5 present the same data from different points of view). *See Section 10 above, regarding the exports from Jordan.

Exporter listed in importer's reports	Source Code listed in importer's report	1999	2000	2001	2002	2003	2004	2005	2006	2007	Grand Total
CA Canada	C		400					84	12		496
ET Ethiopia	W				110						110
ID Indonesia	C					200					200
JO Jordan	C							1,246	1,420	760	3,426
JO Jordan*	W							200	400		600
LB Lebanon	C				200						200
SD Sudan	W		600	400	1,200	500					2,700
TR Turkey	C								184		184
UA Ukraine	C					2,270	996	640	210	20	4,136
UA Ukraine	F		100			1,114					1,214
US United States	C					20		40			60
US United States	W		400		8						408
YE Yemen	W	396									396
Grand Total		**396**	**1,500**	**400**	**1,518**	**4,104**	**996**	**2,210**	**2,226**	**780**	**14,130**

Table 5. Source country and source code of annual commercial trade in live *Uromastyx ornata* as reported by the importing countries (Tables 4 and 5 present the same data from different points of view). *See Section 10 above, regarding the exports from Jordan.

Importing country reporting	Exporter listed in the importer's report	Source Code listed in the importer's report	1999	2000	2001	2002	2003	2004	2005	2006	2007	Grand Total
CA Canada	UA Ukraine	C						112	200	150		462
CA Canada	UA Ukraine	F					110					110
CA Canada	US United States	C							40			40
CA Canada	US United States	W		400		8						408
DE Germany	SD Sudan	W		200								200
FR France	SD Sudan	W		300	100	100	150					650
FR France	UA Ukraine	C					1,050	30				1,080
HK Hong Kong	JO Jordan	C								80		80
HK Hong Kong	UA Ukraine	C									20	20
ID Indonesia	JO Jordan	C									20	20
ID Indonesia	SD Sudan	W					150					150
ID Indonesia	UA Ukraine	C					200					200
IT Italy	UA Ukraine	C								60		60
JO Jordan	SD Sudan	W				1,000						1,000
JP Japan	CA Canada	C							4			4
JP Japan	JO Jordan	C							460	620		1,080
JP Japan	LB Lebanon	C				200						200
JP Japan	SD Sudan	W		100		100	200					400
JP Japan	UA Ukraine	C						12	240			252
JP Japan	UA Ukraine	F		100			24					124
JP Japan	US United States	C					20					20
KR Republic of Korea	CA Canada	C								12		12
MX Mexico	JO Jordan	C								80		80
MY Malaysia	JO Jordan	C								60		60
PT Portugal	UA Ukraine	C						2				2
SE Sweden	UA Ukraine	C					20	40				60
US United States	CA Canada	C		400					80			480
US United States	ET Ethiopia	W				110						110
US United States	ID Indonesia	C					200					200
US United States	JO Jordan	C							786	580	740	2,106
US United States	JO Jordan*	W							200	400		600
US United States	TR Turkey	C								184		184
US United States	UA Ukraine	C					1,000	800	200			2,000
US United States	UA Ukraine	F					980					980
US United States	YE Yemen	W	396									396
ZA South Africa	SD Sudan	W			300							300
Grand Total			**396**	**1,500**	**400**	**1,518**	**4,104**	**996**	**2,210**	**2,226**	**780**	**14,130**

PROPOSAL TO AMEND THE STANDARD REFERENCE FOR *UROMASTYX* SPP.

1. This Annex has been prepared by Israel after consultation with the Animal Committee's specialist on zoological nomenclature.

2. The genus *Uromastyx* has been listed in Appendix II since 1977. At the 13th Conference of the Parties in Bangkok in 2004 a standard reference for the taxonomy of the genus *Uromastyx* was chosen for the first time, which is Wilms (2001)[1] (See: Res. Conf. 12.11 (Rev. CoP 14). This reference lists 16 species in the genus *Uromastyx*.

3. Subsequent to that, a new species in this genus, *Uromastyx yemenensis*, was identified by Wilms & Schmitz (2007)[2]: and therefore the Animals Committee has recommended adding this paper as a standard reference for this species only (see AC24 Doc. 13 Rev. 1 and Notification 2009/044).

4. Subsequent to the Animal Committee's meeting in 2009, a new review of the taxonomy of the genus *Uromastyx* was published by Wilms et. al (2009)[3]. The authors of this paper used modern morphological, genetic and statistical studies to establish the most correct taxonomy for this group (see Table 1 on the next page of this document). Wilms et. al (2009) listed 13 species in the genus *Uromastyx* (including *U. yemenensis*) and moved 3 species from *Uromastyx* to the genus *Saara* (which is not currently in the CITES Checklist). They removed one species (*U. leptieni*) from the list entirely and designated it as a synonym of *Uromastyx aegyptia*.

5. We propose that the CoP adopt Wilms et. al (2009) as the CITES Standard Reference for these 16 species of *Uromastyx* and *Saara*, instead of the proposal by the AC to keep Wilms (2001) as the standard reference for most of the species and to add Wilms & Schmitz (2007) as the standard reference for only *Uromastyx yemenensis*.

6. An additional benefit to adopting Wilms et. al (2009) as the CITES Standard Reference for *Uromastyx* and *Saara*, is that Wilms (2001) is a difficult paper to find, it is in German, and it is very long (over 140 pages), whereas Wilms et. al (2009) is more readily available, is in English and is much shorter.

7. Electronic versions (PDF files) of Wilms & Schmitz (2007) or Wilms et. al (2009) may be obtained by e-mail from Israel's CITES Scientific Authority, Dr. Simon Nemtzov, at: simon@npa.org.il.

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1 *Wilms, T. (2001). Dornschwanzagamen: Lebensweise, Pflege und Zucht. Herpeton, Verlag Elke Köhler, Offenbach.*

2 Wilms, T.M. & Schmitz, A. (2007): A new polytypic species of the genus *Uromastyx* Merrem, 1820 (Reptilia: Squamata: Agamidae: Leiolepidinae) from southwestern Arabia. Zootaxa, 1394: 1-23.

3 Wilms, T, W. Böhme, P. Wagner, N. Lutzmann & A. Schmitz (2009). On the phylogeny and taxonomy of the genus *Uromastyx* Merrem, 1820 (Reptilia: Squamata: Agamidae: Uromastycinae) - resurrection of the genus *Saara* Gray, 1845. Bonner Zoologische Beiträge 56: 55-99.

Table 1. The impact upon the CITES Checklist of adopting Wilms et al. (2009) as the new standard reference for *Uromastyx* spp.[4]

Taxon according to the current standard reference (Wilms, 2001) as listed in Res. Conf. 12.11 (Rev. CoP 14)	**Taxon according to WILMS, BÖHME, WAGNER, LUTZMANN & SCHMITZ (2009)**	**Comments**	**Changes needed to Appendices if Wilms et. al (2009) is adopted**
Uromastyx acanthinura	*Uromastyx acanthinura*		None
Uromastyx aegyptia	*Uromastyx aegyptia*		None
Uromastyx alfredschmidti	*Uromastyx alfredschmidti*		None
Uromastyx asmussi	*Saara asmussi*	Generic change	Add *Saara* spp.
Uromastyx benti	*Uromastyx benti*		None
Uromastyx dispar	*Uromastyx dispar*		None
Uromastyx geyri	*Uromastyx geyri*		None
Uromastyx hardwickii	*Saara hardwickii*	Generic change	Add *Saara* spp.
Uromastyx leptieni	*Uromastyx aegyptia*	*Uromastyx leptieni* lumped into *U. aegyptia*	None
Uromastyx loricata	*Saara loricata*	Generic change	Add *Saara* spp.
Uromastyx macfadyeni	*Uromastyx macfadyeni*		None
Uromastyx occidentalis	*Uromastyx occidentalis*		None
Uromastyx ocellata	*Uromastyx ocellata*		None
Uromastyx ornata	*Uromastyx ornata*		None
Uromastyx princeps	*Uromastyx princeps*		None
Uromastyx thomasi	*Uromastyx thomasi*		None
	Uromastyx yemenensis	Suggested for adoption by the AC on basis of original description[2]	None

[4] *Thanks to the Animal Committee's specialist on zoological nomenclature, Ute Grimm, for reviewing the references and preparing this Table.*