

Loss of biodiversity in Iranian Mountains (Mountains under pressure)

Ahmad Mahdavi, professor emeritus at University of Tehran,
PhD, Entomologist, ecotoxicologist,
UN-FAO focal point for Mountain Partnership in the University of Tehran,
UN Environment- CMS preventing poisoning group,
UN Environment focal point for Environmental Education in the University of Tehran.
University of Tehran/ and Sustainable agriculture and environment.
Phone: +98-21-76281966 --- Mobile: +98-912-0762812.
P. O. Box: 19615-544, Tehran, IRAN.



Iranian Mountains



Causes of biodiversity loss in Iranian mountains

- Construction (case study: Pardis city, also in North of Tehran;
- Pollution (case of Arak due to toxic air)
- Wildlife poisoning;
- Recent destruction of wild mountain plants to be sold as herbs in markets;
- Fire in Zagros mountains;
- Uncontrolled mountain tourism & waste in mountains.

Preventing wildlife poisoning: case study from Iran and applicable international vs national regulatory issues

Ahmad Mahdavi, professor emeritus at University of Tehran,
PhD, insect/ pesticides/ chemicals/ biocides environmental regulatory toxicologist,
UNEP focal point for Environmental Education in the University of Tehran.
University of Tehran /and Sustainable agriculture and environment.
P. O. Box: 19615-544, Tehran, IRAN.

Second Meeting of the UNEP/CMS Preventing Poisoning Working Group
(PPWG2), Toledo, Spain, 19- 21 February 2017



- From CMS convention: for some species of migratory birds poisoning is the primary cause of their unfavorable conservation status
- CMS Resolution 11.15 'Preventing Poisoning of Migratory Birds'



Wildlife poisoning by insecticides: Iran vs World

- History: Carbofuran;**Insects!??**
- My Guelph observation: birds dropping from sky (Mc Even & Stephenson: 1979, use and significance of pesticides in the environment, University of Guelph, Guelph, Ont., Canada);
- Carbamates: Aldicarb (LD50=2 mg/kg);
- Ops: diazinon (my work), Monocrotophos;
- **Neonicotinoids: in Iran- in the World;**
- Fipronil a phenyl pyrazole broad-spectrum insecticide is highly toxic to many bird species;
- Also impacts on earthworms/ other bird feeds;
- DDT/ POPs: birds eggshell thickness?



Insects (Hexapoda)

Global view

- Big collapse of Insect populations in nearly all insect orders;
- Beetles: the most diverse order in animal kingdom: sharp decline;
- Lepidoptera: Sharp population decline in many families;
- Sharp decline in pollinators.

Insects

What's Causing the Sharp Decline in Insects, and Why It Matters

- Scientists have described 1 million species of insects so far, and estimate at least 4 million are still unrecorded;
- Only 10000 species are pests to our food, fiber, health, livestock.

CHRISTIAN SCHWÄGERL

JULY 6, 2016

- Insect populations are declining dramatically in many parts of the world, recent studies show.
- Researchers say various factors, from monoculture farming to habitat loss, are to blame for the plight of insects, which are essential to agriculture and ecosystems.



THE MOUNTAIN CONSERVANCY

Fostering Biodiversity in the Mountains

P.O. Box A
Phillips, ME 04966



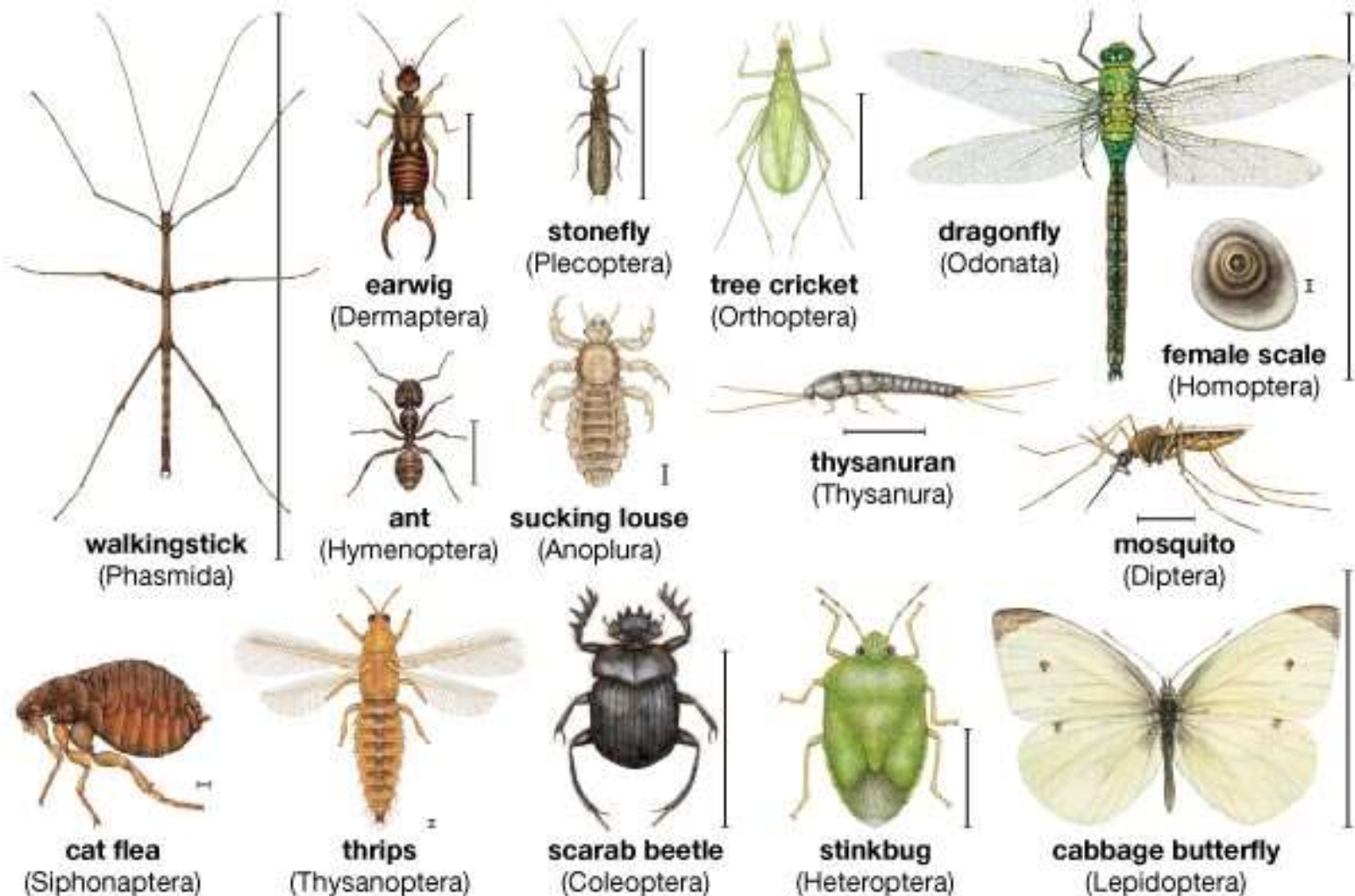
THE MOUNTAIN CONSERVANCY

Fostering Biodiversity in the Mountains

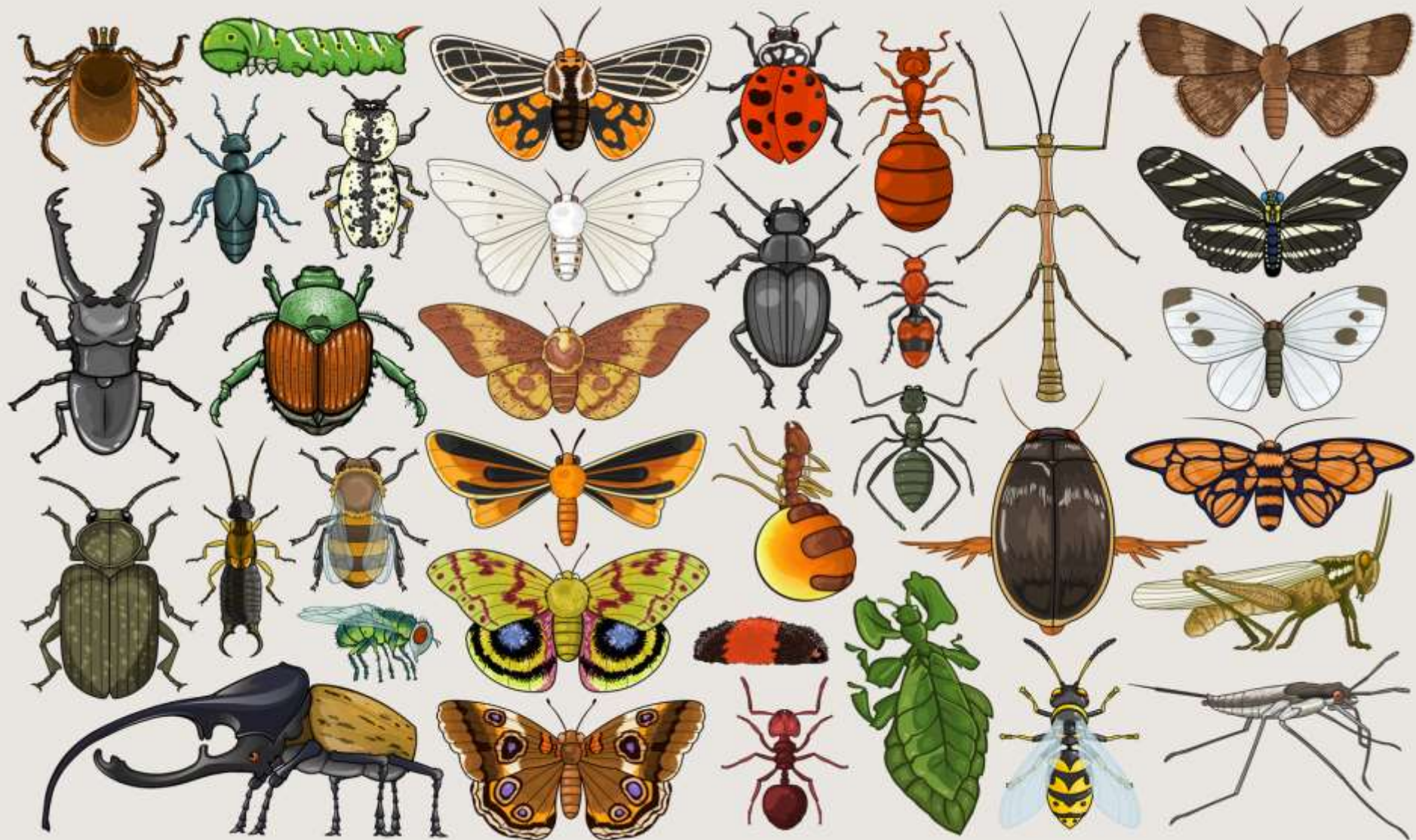
P.O. Box A
Phillips, ME 04966

Where Have All The Insects Gone?

Everyone Including Birds Depend On Them For Food



Insect orders (more than 40) under threat

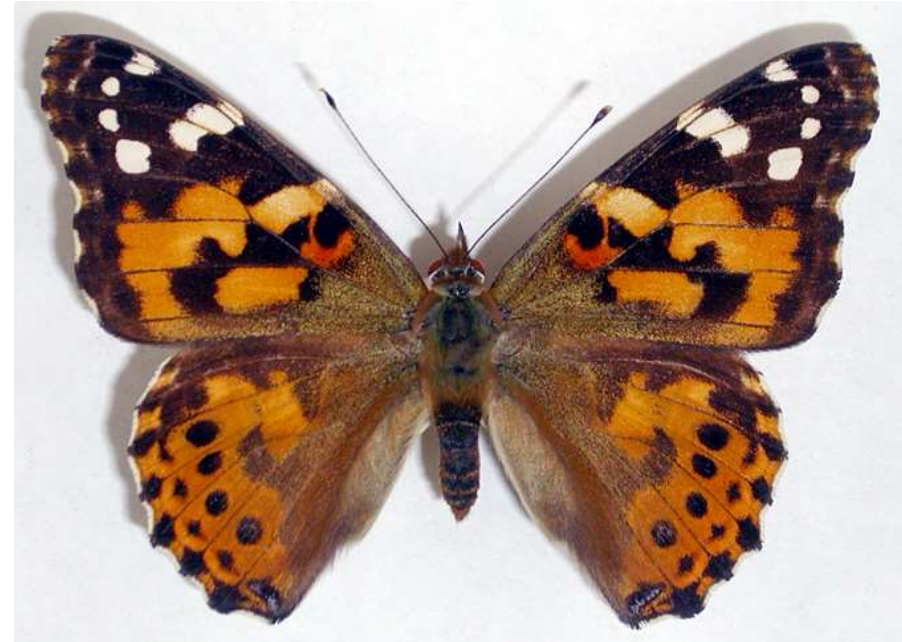


Insects (Hexapoda)

Case study: Iranian mountains

Lepidoptera

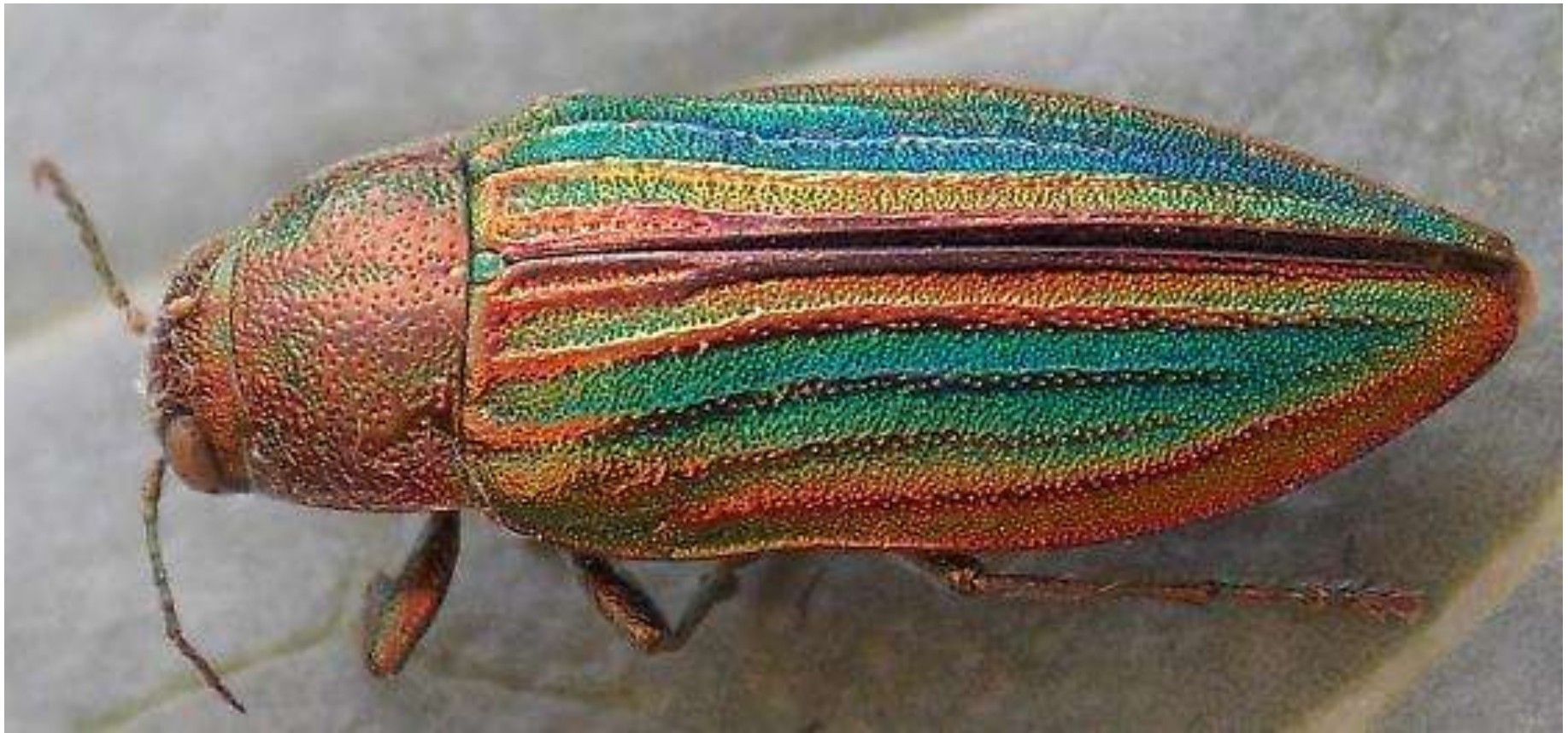
- Case study: Lepidoptera: *Nymphalidae*



Insects (Hexapoda)

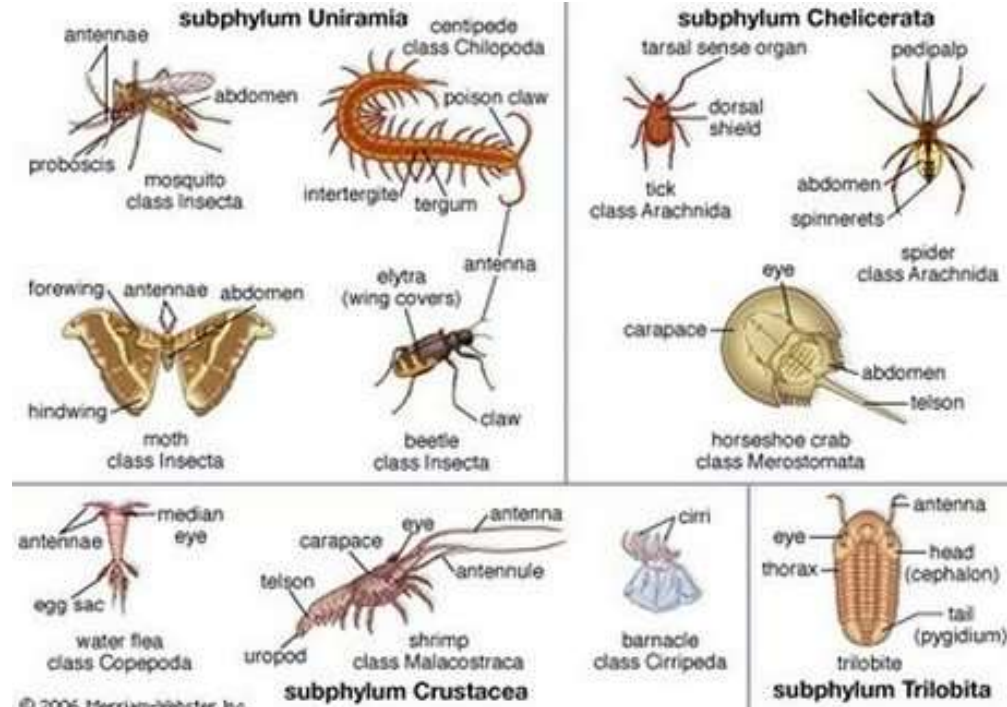
Case study: Iranian mountains

- Coleoptera:
- Case study: Buprestid beetles



Other Arthropoda

- Arachnida & Scorpions &.....
- Case study Arak mountains



Vertebrates



Sharp decline of biodiversity in Iran

- Iran has already lost more than %90 of its total biodiversity due to:
- Unregulated hunting, poaching
- Deliberate poisoning by herd owners, Illegal hunters!!

Loss of biodiversity in Iranian Mountains

- Sharp losses of wild plant species;
- Sharp losses in mountain goats;
- Loss of vulture in Iranian mountains
- Scientists-warning:
- <https://www.youtube.com/watch?v=URi0WU7-Ey0>
- scientistswarning@oregonstate.edu
- **Wikipedia:** The Karkas mountain chain (Persian رشته کوه کرکس Reshteh kuh-e Karkas) is a mountain range which is located almost in central Iran. Having a northwest-southeast direction, it is stretched from Kashan to Ardestan for more than 100 kilometres. With an elevation of 3895 metres, the highest peak of the Karkas Mountains is Mount Karkas which is situated close to Natanz.[1]

Bearded Vulture as endangered species

- The Bearded Vulture occupies an extremely vast range;
- Population densities are low. ...
- Classified as endangered in this area,
- Bearded Vulture numbers are dwindling due to habitat loss and degradation, together with human-raptor conflict.

Karkas mountains chain (Central Iran) locally Called: Karkas_Kooh



Big declines in bird populations

Case study: Huma, the birded vulture:

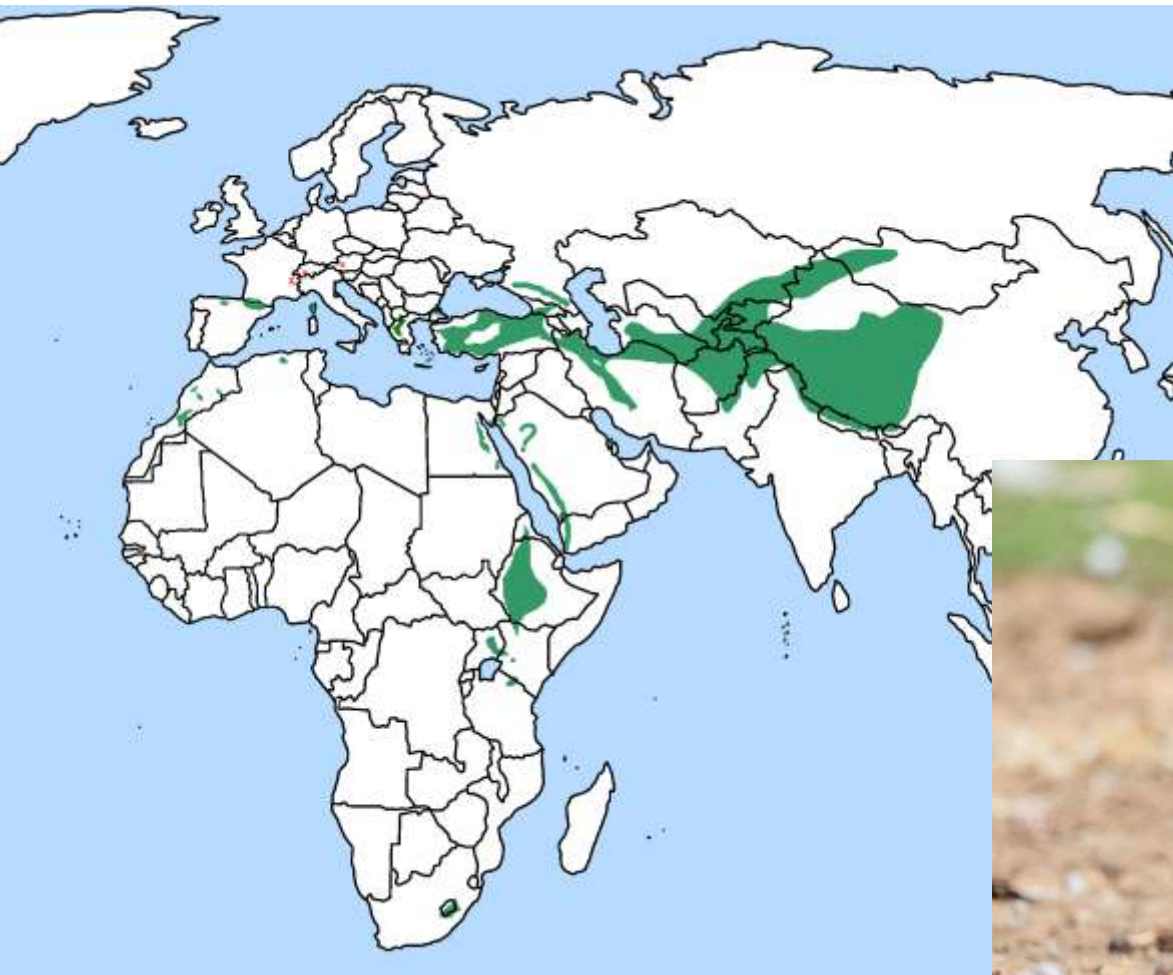
Bartgeier Gypaetus barbatus

The IUCN Red List of Threatened Species™



Gypaetus barbatus distr

Bearded Vulture: Soaring to Extinction?



Wildlife poisoning by rodenticides in Iran

- Second generation anticoagulant rodenticides (SGARs) used widely in open agricultural fields in Iran;
- No program baiting, Permanent baiting, No later removal;
- No best practice guidelines followed;
- Wide use in cities as biocides/ some program baiting/ awareness followed.

Unless under the supervision of a pest control operator / other competent person, do not use anticoagulant rodenticides as permanent baits.

Impact of second generation anticoagulant rodenticides on non-target wildlife

- According to well documented decades scientific research: there are disastrous impacts;
- Anticoagulant rodenticide (AR) poisoning has emerged as a significant concern for conservation and management of non-target wildlife (Mourad et al, 2012) ;
- Exposure to rodenticides pose big danger for predators/ scavengers when they prey on dead/ moribund rodents.

Hernandez-Moreno et al, 2013, (BRAKES & SMITH, 2005- Elmeros, et al, 2011- Dashti Khavidaki, et al, 2014.....Many refs)



Wildlife poisoning by Poison-baits

- In most cases non-target animals are exposed to poison-baits
- Big/ dangerous advertisement:

What is 1080? 1080 is a registered agricultural poison and is classified as a restricted S7 poison. Compound 1080 (sodium monofluoroacetate).....

PINDONE FOR RABBIT CONTROL

- Metaldehyde- LC50 for fish is 75 mg/L (Bogers, 1990a) and metaldehyde is not readily biodegradable (Wuethrich, 1990a).
- Bioaccumulation in fish

Buckmaster et al, 2014.



Wildlife poisoning by Poison-baits in Iran

- Lots of deliberate intoxication of wildlife by poison baits by herd owners, animal husbandry farms, illegal hunters;
- Feeding of wildlife on these poison baits in Iran;
- Installing signs/ banners etc. in places of toxic bait use does not exist in rural agricultural areas and it is in its starting phase in Iran.



Wildlife poisoning by Poison-baits in Iran

- Veterinary toxicology in early stages, just starting;
- So reporting only to DoE offices/ environmental conservation guards, **many of them (115) already killed by illegal hunters, my experience 40 years ago;**
- No particular training courses about poison-baits up to this date;
- Poison baits in ponds/ wetlands against fish/ birds in the Caspian/ Khuzestan.

Applicable regulatory issues, national vs international Iran

- Recently there are fines, but considering the size/ **diversity of Iran for land, culture, etc.** this needs huge work to rescue remains of wildlife (%90 to %95 lost) in Iran, fines announced;
- Hunting licenses being withdrawn/ sentencing guidelines exist for wildlife poisoning birds, bears, leopards, etc.;
- For example: a bee hive owner that killed hundreds of beautiful colored birds that eat bees and wasps fined & sentenced.



Wildlife Poisoning Prevention and Conflict Resolution: I am a Ranger (with permission)

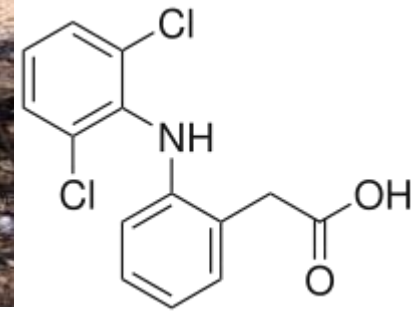


Tired Lion Defenders



Wildlife poisoning by Veterinary pharmaceutical diclofenac in Iran

- No surveillance of ungulate carcasses in high risk areas for diclofenac in Iran;
- No vulture safe zones, Iran is a very diverse mountainous country....;



Wildlife poisoning by Veterinary pharmaceutical diclofenac in Iran

- Diclofenac widely/ freely available for human use;
- Highly/ freely available in all forms in Iranian pharmacies with absolutely **no reporting/ recording system by pharmacies**, so could be easily misused for vet purposes; meloxicam is available.

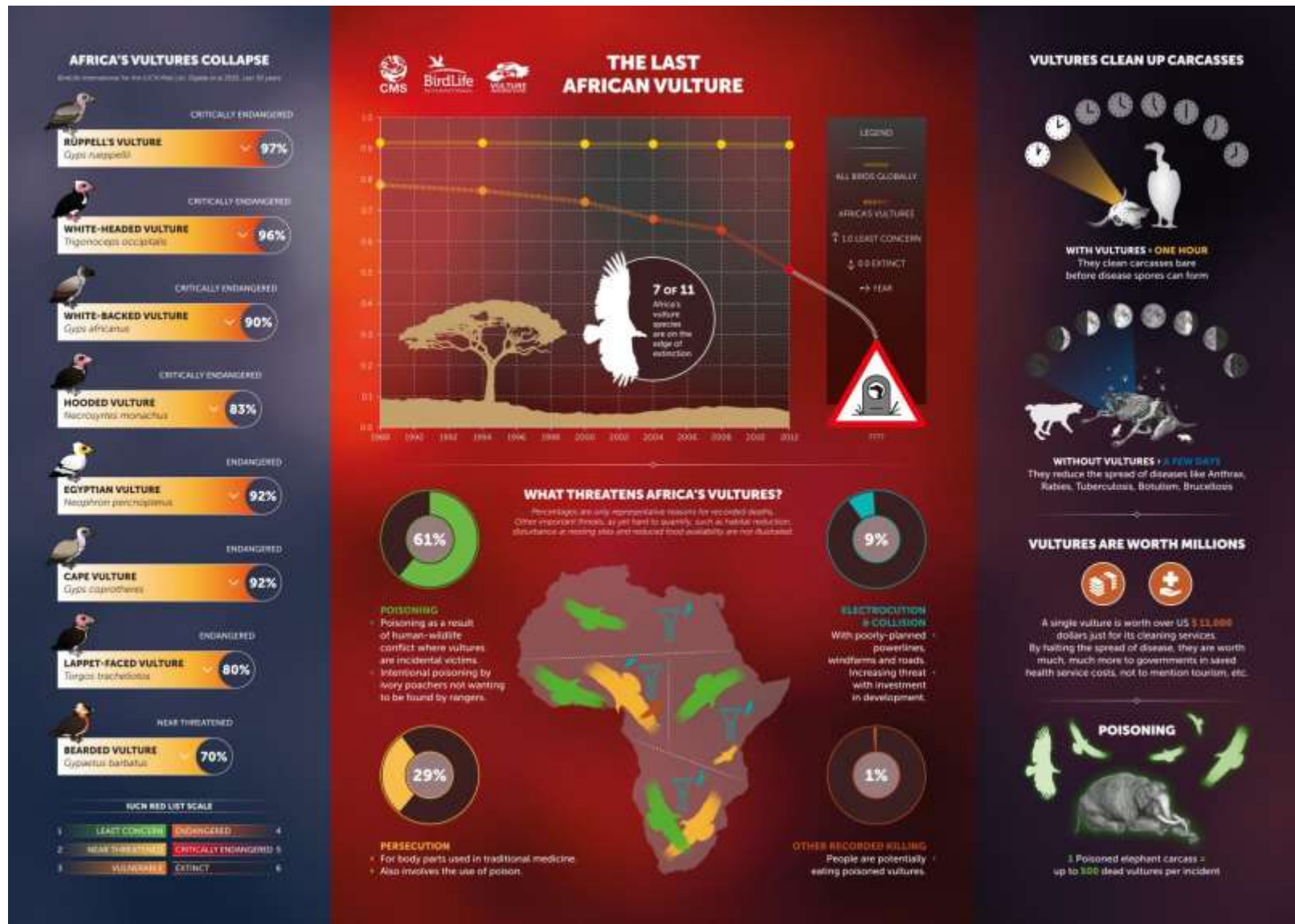


Applicable regulatory issues, national vs international

- A few years ago Iran called stop use of diclofenac in veterinary but ordinary people in remote/ rural areas are not aware about the risk;
- Non-steroidal anti-inflammatories (NSAIDs) removed from the Iranian veterinary market but widely available in pharmacies;
- Any type use of diclofenac is highly prohibited in developed world and even in neighboring countries of Iran.



Vultures have been poisoned and persecuted (Africa)



Wildlife poisoning by lead in Iran

- 1-1.5 million guns on hand of people with 350 million lead bullets targeting wildlife of Iran;
- %90 to %95 of our wildlife species in Iran is already lost forever;
- Absolutely no sign of alternatives for lead ammunitions & no sign of awareness about lead poisoning for wildlife.



Wildlife poisoning by lead in Iran

- This year hunting is prohibited in Iran due to the widespread bird's flu;
- But DoE following its tradition issues lots of licenses again according to the news;
- No deadline of banning lead ammunition by 2017 in Iran.



Applicable regulatory issues, national vs international

- No legislative processes implemented to reduce/ environmental contamination by lead ammunition/ phase out/ lead fishing weights in Iran yet;
- Many academic papers in Iran about lead toxicity for human/ our Iranian society of toxicology with excellent academic paper/ clinical toxicology (Loghman hospital).

Global Alliance to Eliminate Lead Paint at UNEA 2



World Health
Organization

Global Alliance to Eliminate Lead Paint

Newsletter

May 2016

**The Global Alliance to Eliminate Lead
Paint (Lead Paint Alliance) at UNEA 2**

DID YOU KNOW ?

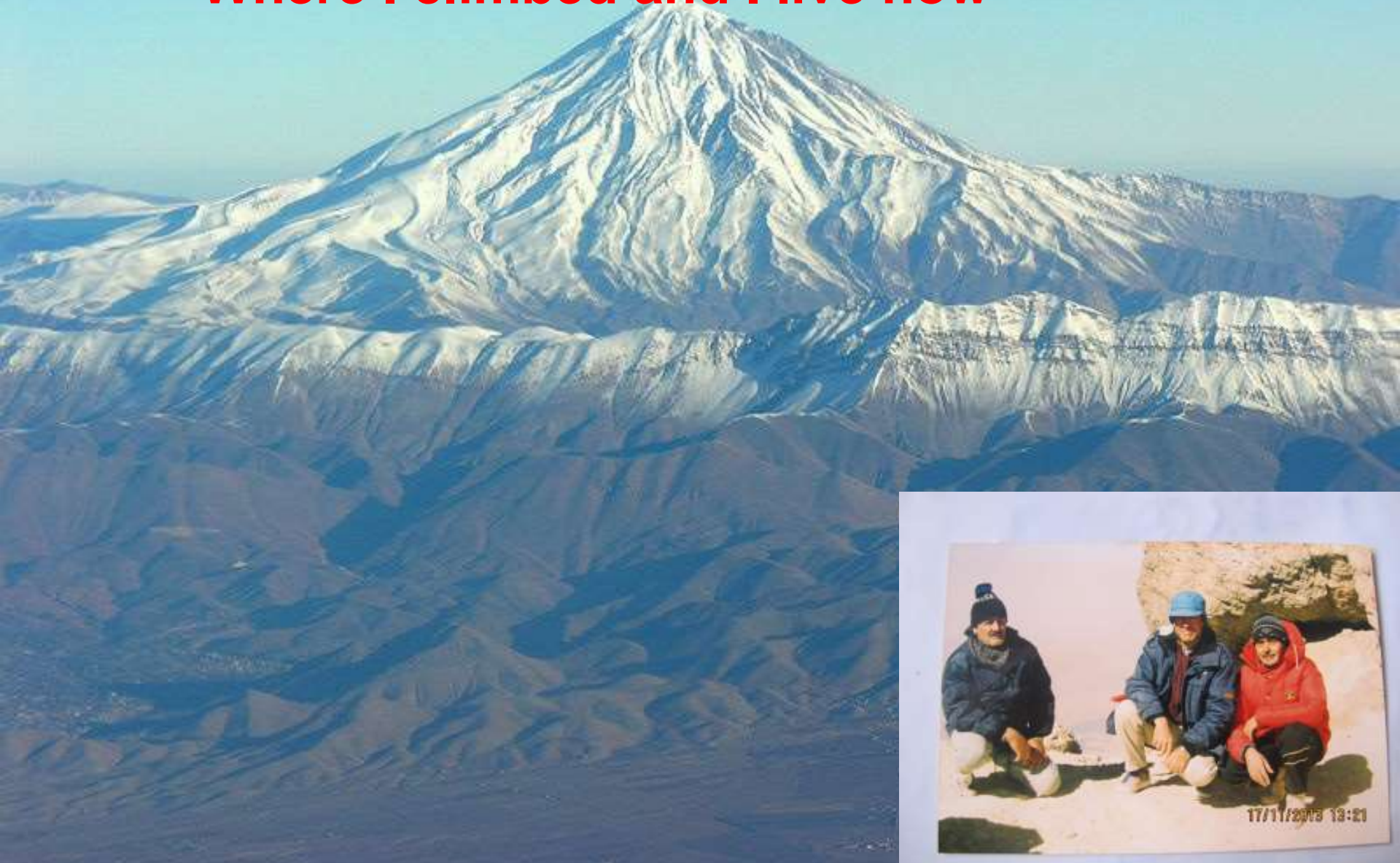
**We need to look deeper on birds
poisoning by looking on what they eat/
pesticides are sequestered in fat/ other
tissues**

**Cumulative exposure,
the whole cup and
synergistic effects in
wildlife/ birds**



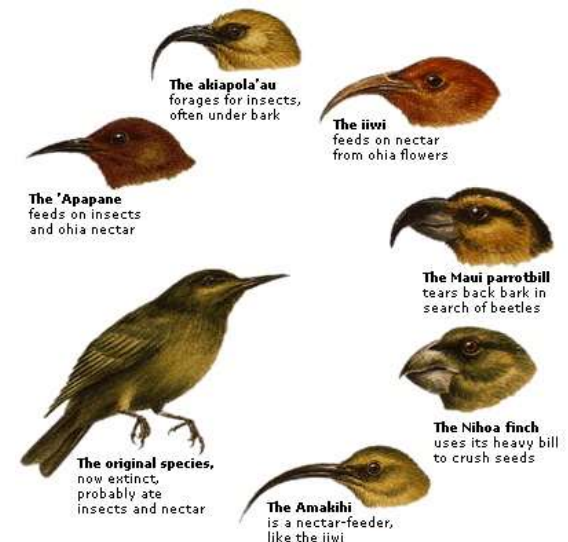
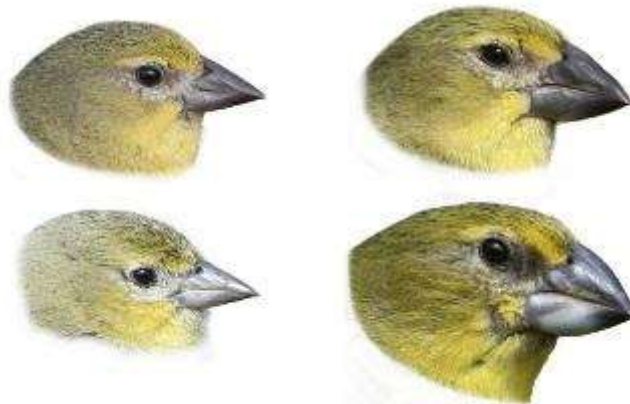
Damavand peak (5800 m)(IRAN)

Where I climbed and I live now



Is speciation continuing?

- The delicate system of speciation mechanisms responsible for creating the diversity of species by evolution/ coevolution is now under real threat and surely cannot continue its natural way after this pollution scenario;
- Is the speed of speciation equal to extinction?
- Now we are in the 6th round of big extinction.



Alborz & Damavand

According to the Damavand Mountain Protectors Society website & my own observations: most environmental problems in Damavand mountains are:

- Mineral activities in 2000 m height and upper areas of the mountain;
- Road construction activities up to 3000 m;
- Southern road up to 3000m;
- Restaurants, refuges...up to 4200m
- Activities of Many mineral water companies.



پایگاه خبری محیط بان دماوند

www.MohitbaneDamavand.ir



پایگاهی جهت گسترش فرهنگ حفاظت از محیط زیست و دفاع از محیط بانان



اخبار

اخبار محیط زیست ایران

اخبار محیط زیست تهران

اخبار محیط زیست دماوند

Plant species

- Iran a very diverse country
- Diverse in land, culture, language, etc.;
- Very diverse in plants: 8000 plant species equal to that of whole EU;

Pyrethrum flowers

- **Pyrethrum** was a genus of several Old World plants now classified as Chrysanthemum or Tanacetum (e.g., *C. coccineum*) which are cultivated as ornamentals for their showy flower heads.
- **Pyrethrum** continues to be used as a common name for plants formerly included in the genus *Pyrethrum*.
- Pyrethrum is also the name of a natural insecticide made from the dried flower heads of ***Chrysanthemum cinerariifolium***.

From Wikipedia, the free encyclopedia

Tanacetum cinerariifolium



Pyrethrums, pyrethrins and Pyrethroids (Natural vs. Synthesized)

- Pyrethrins and **Persian lice Powder:**
- During my studies on synthetic Pyrethroids in North America I encountered with some reports about the Persian Louse Powder related to thousand years ago;
- This is a proud story about our past capabilities in science and in particular Alchemy. <<Persians in old time were extracting a drug called Persian Louse Powder from *Composite* flowers and were exporting it to the World (Mahdavi, A. 2012);
- Later in recent time this turned to be a big science and profit for other countries extracting Pyrethrins from the species *Chrysanthemum cinerariaefolium*.

Zagros mountains forests

Fire as big factor of loss in biodiversity

Sarkan mountains (Lorestan)



Fire as big factor of loss in biodiversity

Sarkan mountains (Lorestan)



Oshtrankooh

(Protected area)

- Zagros Mountain area in Lorestan, West of Iran;
- Area:106000 Hectares;
- 1300m to 4080m height;
- Protected since about 50 years ago;
- 600 plant species: 68 endemic;
- 274 animal species;

Big threat to mountain plants and herbs all over the country

- Overharvesting of mountain plants and herbs as a business in local markets;



Rhubarb- *Rheum rhaponticum* & many other species (*Polygonaceae*)

<http://daneshnameh.roshd.ir/mavara/mavara-index.php?page>





Cirsium vulgare



Berberis vulgaris



Flowers

Iran: land of inverted tulips



Environmental issues in Iranian Caves

- Recent news: caves as a very important reservoirs of water & Ice for the planet;
- Workshop for protection of 80 caves in Alborz (www.doe.ir);
- Cave cleaning activities in “Clean Cave day”;
- Cave Ids, sustainable cave tourism programs & regulations.....by DoE of Iran;
- Varkesh group activities for caves Fauna (www.varkesh.com).



Acknowledgement

My special thanks and appreciation to the Secretariat of the Mountain Partnership for providing me financial support to be able to come and talk about this important issue.

Now it is decades that my life is totally dedicated to protect people and environment against toxic pollution with a very simple life under 3R concepts (reduce, reuse, recycle).

Masoole (Gillan)(IRAN)



Thank you Questions?

- Only after the last tree has been cut down,
- only after the last river has been poisoned,
- only after the last fish has been caught,
- only then will you find that money cannot be eaten.'
- CREE INDIAN PROPHECY.