



3RD INTERNATIONAL JACKAL
SYMPOSIUM
02-04. NOVEMBER 2022
GÖDÖLLŐ, HUNGARY

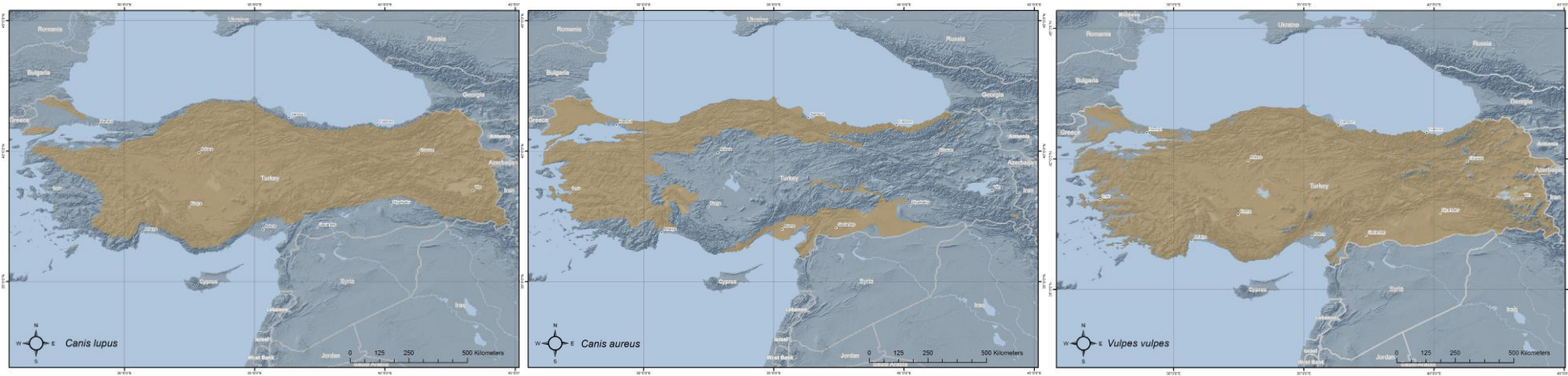


Camera trapping as a tool for diagnosing and monitoring mange disease

Alper Ertürk, Anil Soyumert

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Canids in Turkey



*Ambarlı et al. 2016

*Ambarlı, H., Ertürk, A., & Soyumert, A. (2016). Current status, distribution, and conservation of brown bear (Ursidae) and wild canids (gray wolf, golden jackal, and red fox; Canidae) in Turkey. *Turkish Journal of Zoology*, 40(6), 944-956.

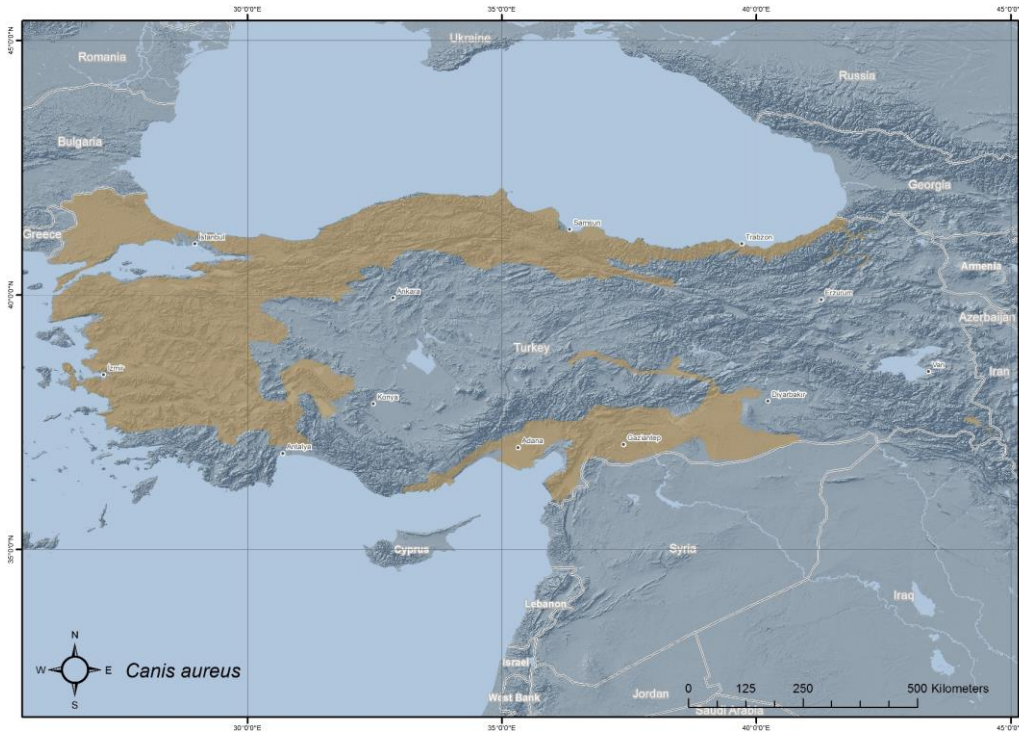


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Golden Jackal in Turkey



- Mostly colonized in coastal regions and river basins
- Abrupt altitudinal changes limits colonization
- Presence of wolves with other hard environmental conditions shapes the distribution

Golden Jackal in Turkey

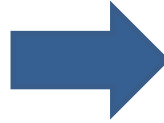


- Game animal
- No conservation measures
- No high-level conflict with humans
- Inhabit several types of habitats

Zoonotic Diseases

- more than 300 diseases dispersed worldwide
- 60.3 % are zoonoses
- 71.8 % wildlife originated
- increasing trend since 1940

Jones et al. 2008*



- affects human health
- threatens livestock
- threatens pastures
- complicates conservation practices
 - perception of local people
 - threatens wild animals

*Jones K. E., N.G. Patel, M. A. Levy, A. Storeygard, D Balk, J. L. Gittleman, and P. Daszak 2008. Global trends in emerging infectious diseases. Nature 451:990-0993



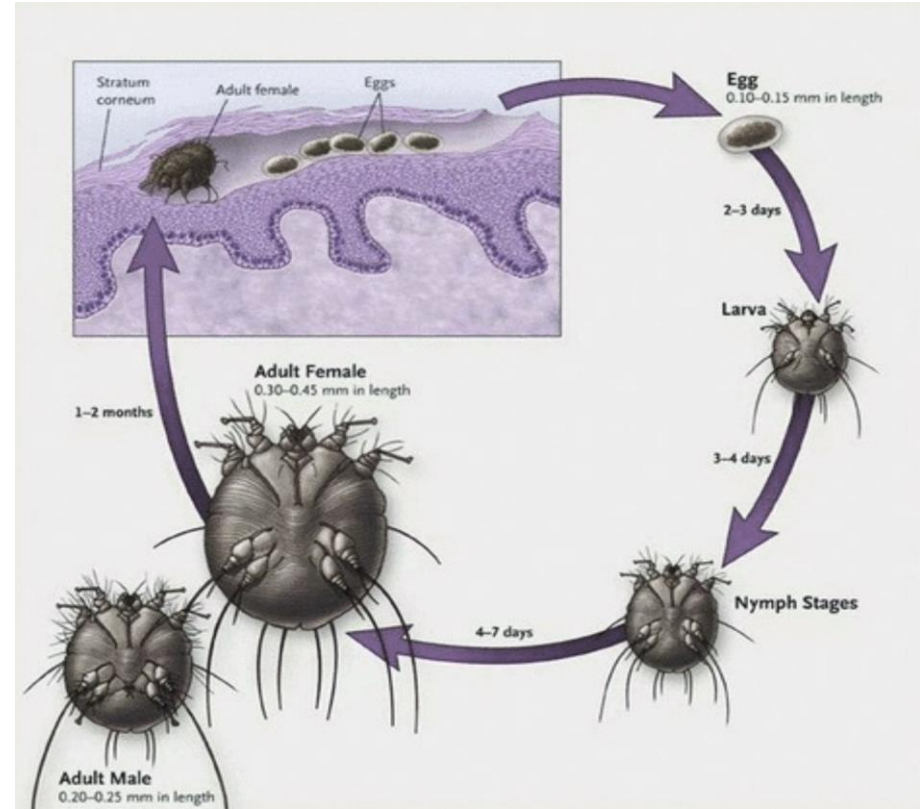
Mange Disease

- Sarcoptic mange
 - *Sarcoptes scabiei*
 - Common in Canids
- Notoedric mange
 - *Notoedres cati*
 - Common in Felids
- Demodectic mange
 - *Demodex folliculorum*
 - Videspread in mammals including Ursidae and Cervidae)



Mange Disease

- Infestation of skin by Itch mite (*Sarcoptes scabiei*)
- Highly contagious and may become fatal for canids
- The mites burrow into the skin, cause severe itching and hair loss
- Nonseasonal
- Also threat for pets and hunting dogs



Currie, Bart J., and James S. McCarthy. "Permethrin and ivermectin for scabies." *New England Journal of Medicine* 362.8 (2010): 717-725.

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Sarcoptic mange

- Itchy sore skin
- Redness and rash
- Hair loss
- Crusts on skin
- Inflammation
- Emaciation
- Animal dies eventually due to secondary infection, hypothermia or starvation



CameraName

73 F22 °C

07-28-2017 15:59:26



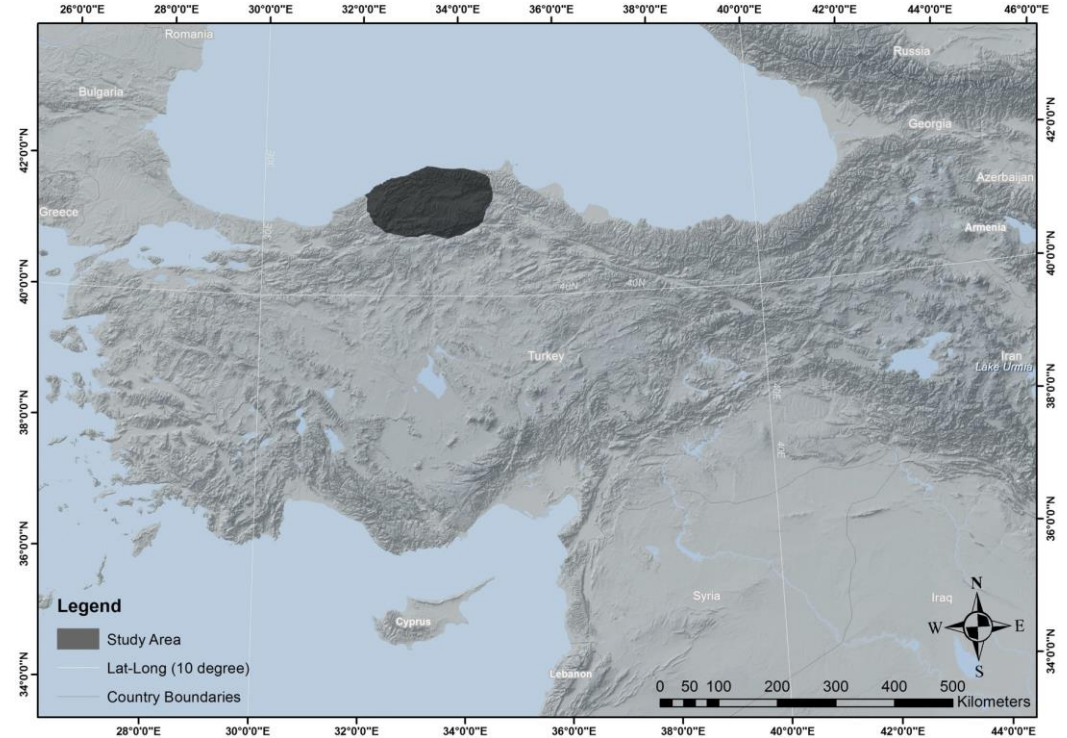
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Study Area

Distribution Map



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Study Area



- 12 study sites
- 5 wildlife development sites
- 2 national parks
- Mixed temperate forest dominated by oriental beech (*Fagus orientalis*) and Trojan fir (*Abies nordmanniana*) in high altitudes

Study Area

*Intact assemblages**

World: 108 Regions

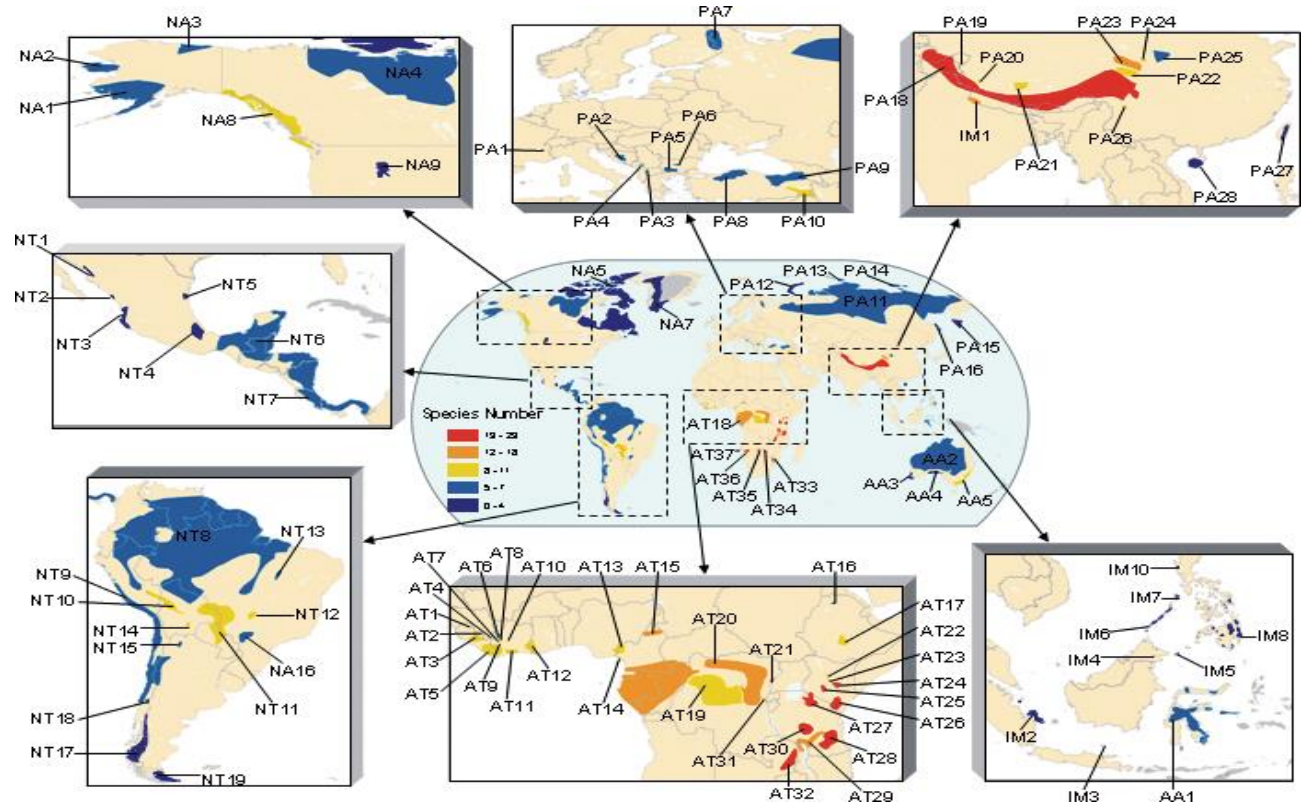
Europe: 10 Regions

Anatolia: 3 Regions

Eastern Turkey

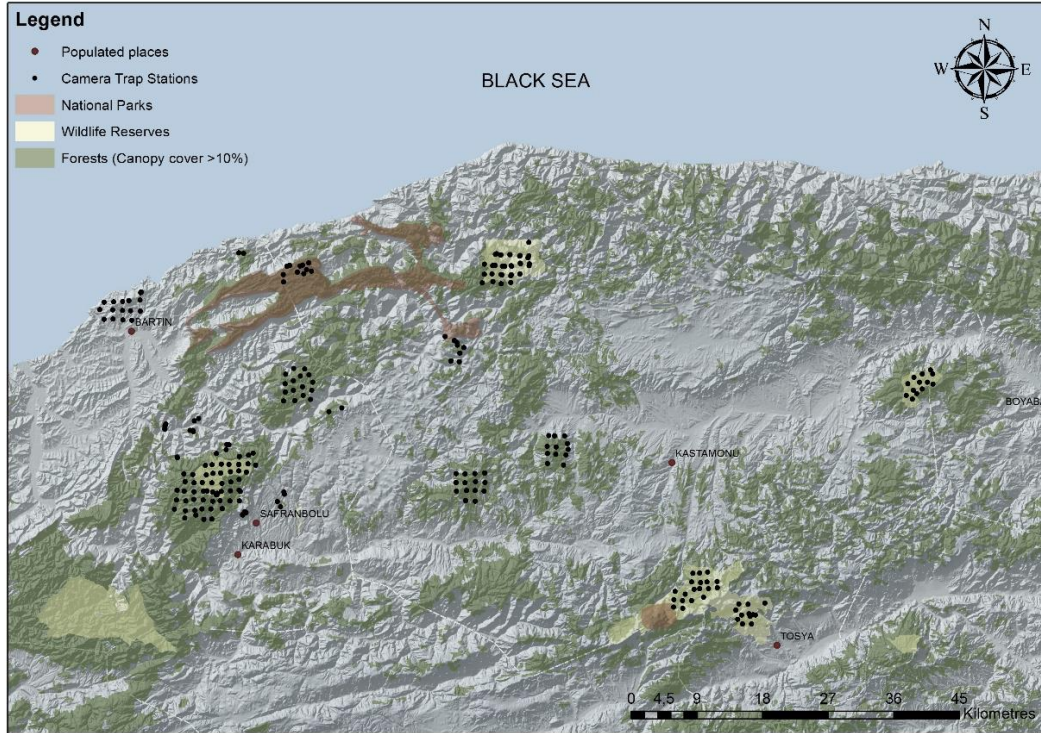
Lesser Caucasus

Western Black Sea



*Morrison, J.C., Sechrest, W., Dinerstein, E., Wilcove, D.S., Lamoreux, J.F., 2007, Persistence of large mammal faunas as indicators of global human impacts. *Journal of Mammalogy* 88(6),1363–1380.

Camera Trap Study Design



- Survey period: 2007 – 2020
- Systematic & Opportunist
 - 4 km² grids
- # of camera-trap stations: 256
- # of camera-trap day: 65,746
- # of Canid records: 20186
- # of large and medium sized mammal species: 14

Camera Trap Data



n = 5842



n = 12635



n = 1709





n = 20



n = 27

Data analysis

Generalized Linear Mixed Model *lme4* (Bates et al., 2015)

- RAI of indiv. with lesions -> binomial distribution

General Linear Mixed Model *nlme* (Pinheiro et al., 2016)

- RAI of indiv. with lesions -> log10 transformed

inv. with lesions -> dependent variable

Covariates -> fixed factor

Sites and season -> random factor

- Covariates
 - Distance to the nearest settlement
 - Rural Population density
 - Landuse map (distance from antropogenic structures)
- Factors
 - Season
 - Study site



Preliminary Results and Conclusion

- There is no seasonality -> animals with lesions recorded throughout the year
- There is no spatial difference -> no significant clustering in a specific habitat conditions any environmental variable
- We did not recorded any jackal individuals with lesions

- Camera-trapping can be effective method to monitoring diseases which can be diagnosed from visual data
- However, the relatively low number of records could reasoned by low detectibility
- Integrating other methods to the monitoring can be useful



Thank you...

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