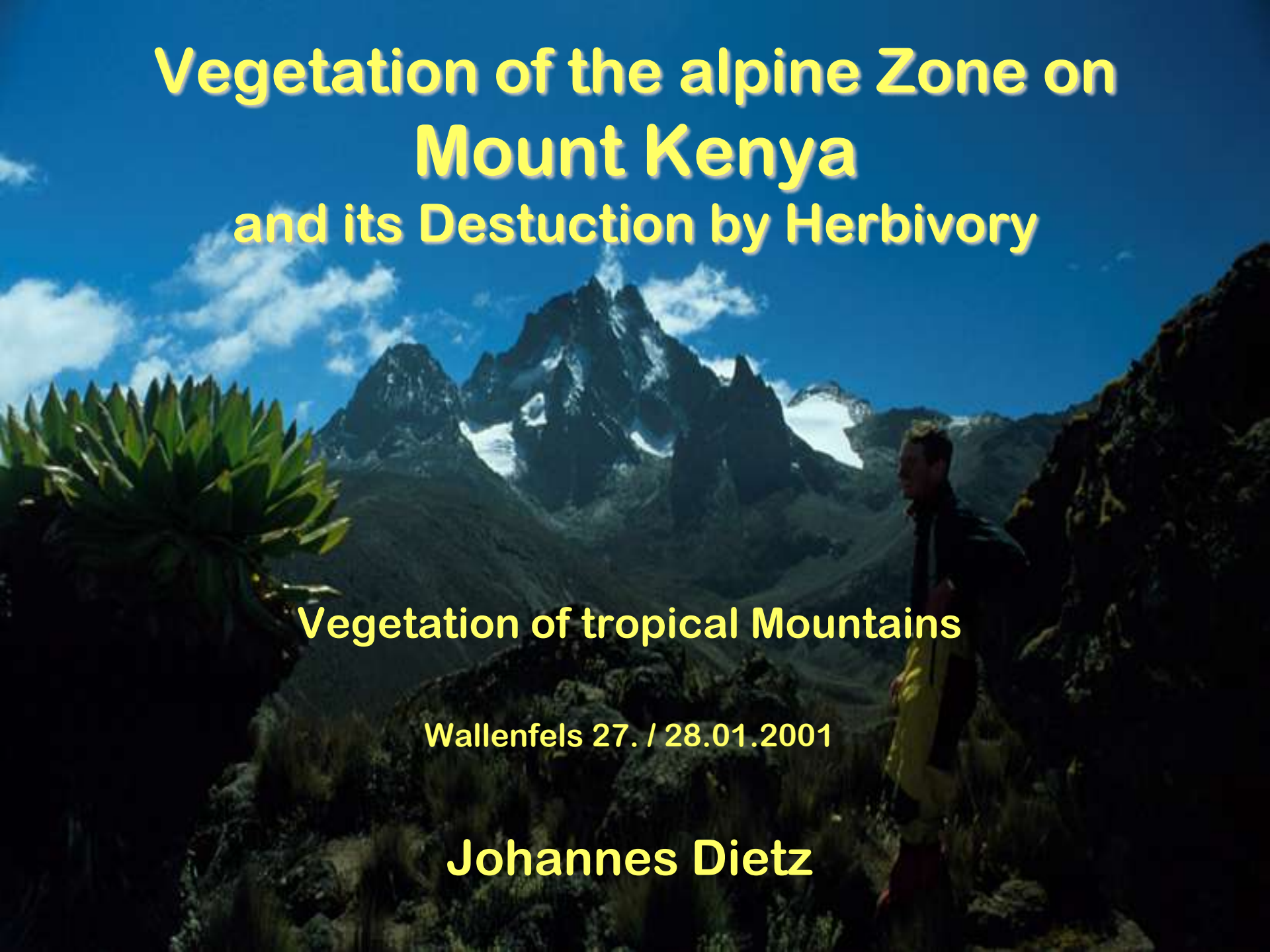
Vegetation of the alpine Zone on Mount Kenya

and its Destuction by Herbivory



Vegetation of tropical Mountains

Wallenfels 27. / 28.01.2001

Johannes Dietz

Overview

- Introduction
- Vegetation of the alpine Zone of Mount Kenya and its Ecological Implications
- Herbivores of the alpine Zone of Mount Kenya
- Damage of Vegetation
- Causes and Hazards
- Conclusion

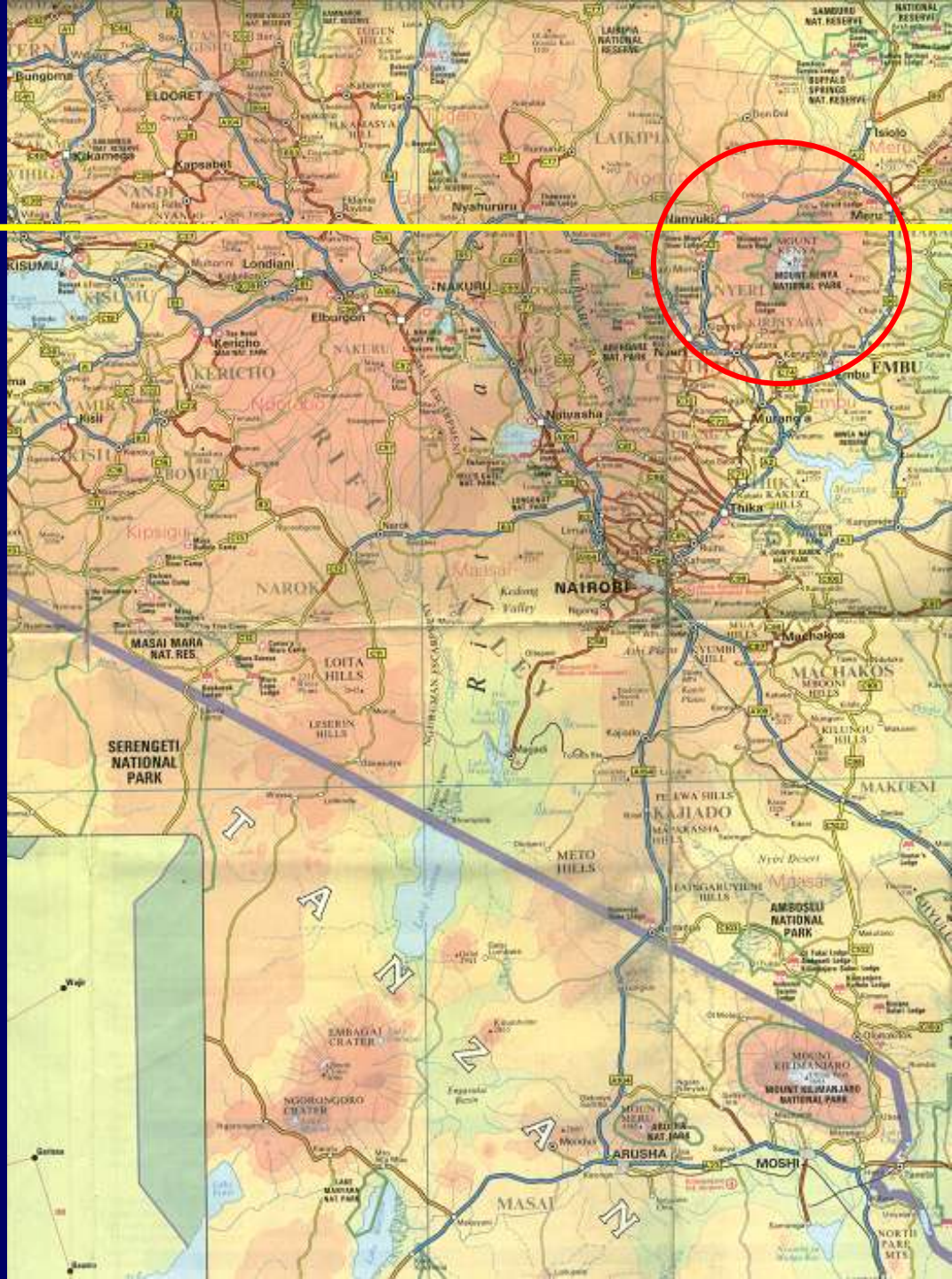
Introduction

Geography

Equatorial Position

⇩

2 Dry Seasons



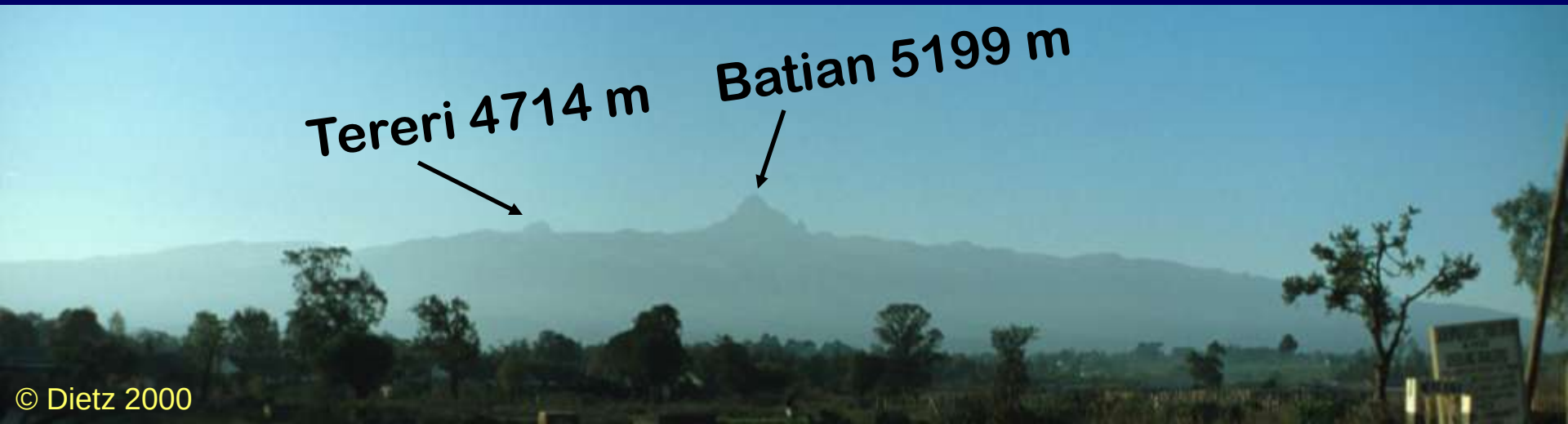
Introduction

Topography

- Former Volcano
- Presently galciated
- ø 120 km

Altitudinal Zonation

Highlands	1800 m
Timberline	3300 m
Lower Alpine Zone	3800 m
Upper Alpine Zone	4500 m
Nival Zone	5200 m



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Vegetation
Lower Alpine Zone

- Peak Precipitation Zone
- Partly Peaty Soils
- Tussock Grasses
- *Erica arborea*
- *Lobelia deckenii* ssp. *keniensis*
- *Senecio keniensis* ssp. *brassica*

Vegetation
Lower Alpine Zone



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Vegetation
Upper Alpine Zone

- Glaciogenic Valleys
- Pronounced Nocturnal Frosts
- Soils Shallower and Drier
- Sites Dependent on Soil Moisture
- *Lobelia telekii*
- *Senecio keniodendron*
- *Alchemilla* ssp.
- *Helichrysum* ssp.

Vegetation

Upper Alpine Zone



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Vegetation

Giant Rosette Plants

Senecio keniensis ssp. *brassica*

- Synonym: *Senecio brassica*
- Moist Sites
- Stemless
- White, Felty Leaf Bottom



Vegetation

Giant Rosette Plants

Senecio keniensis ssp. *brassica*

- Synonym: *Senecio brassica*
- Moist Sites
- Stemless
- White, Felty Leaf Bottom



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Vegetation

Giant Rosette Plants

Lobelia deckenii ssp. *keniensis*



- Synonym: *Lobelia keniensis*
- Moist Sites
- Branched on the Ground
- Constantly Filled with Water

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Lobelia deckenii ssp. *keniensis*



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Vegetation

Giant Rosette Plants

Senecio keniodendron



- Synonym: *Dendrosenecio k.*
  Solanecio k.
- Well Drained Sites
- Braching after each Flowering
- Up to 10 m

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Senecio keniodendron



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Senecio keniodendron





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Vegetation

Giant Rosette Plants

Lobelia telekii

- Well Drained Sites
- Unbranched
- Dies after Flowering
- Up to 2,5 m (Inflorescence)



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Lobelia telekii



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Herbivores
Alpine Zone

- Buffalo (*Syncerus caffer*)
- Elephant (*Loxodonta africana*)
- Insects (*Hemiptera*-, *Diptera*-, *Coleoptera*-, *Lepidoptera*-Larvae)
- Duiker (*Sylvicapra grimmia altivallis*)
- Groove-Toothed Rat (*Otomys orestes orestes*)
- Rock Hyrax (*Procavia johnstoni mackinderi*)

Herbivores
Groove-Toothed Rat

- **Dispersion**: Ubiquitous
- **Nutrition**: Mainly Roots and Seeds
- **Habitat**: Under Tussock Grasses
  and in Rosettes of *Senecio keniodendron*,
  also Moister Biotopes
- Predators: Augurbuzzard, Verreaux Eagle,
  Mackinders Owl, Leopard

Herbivores

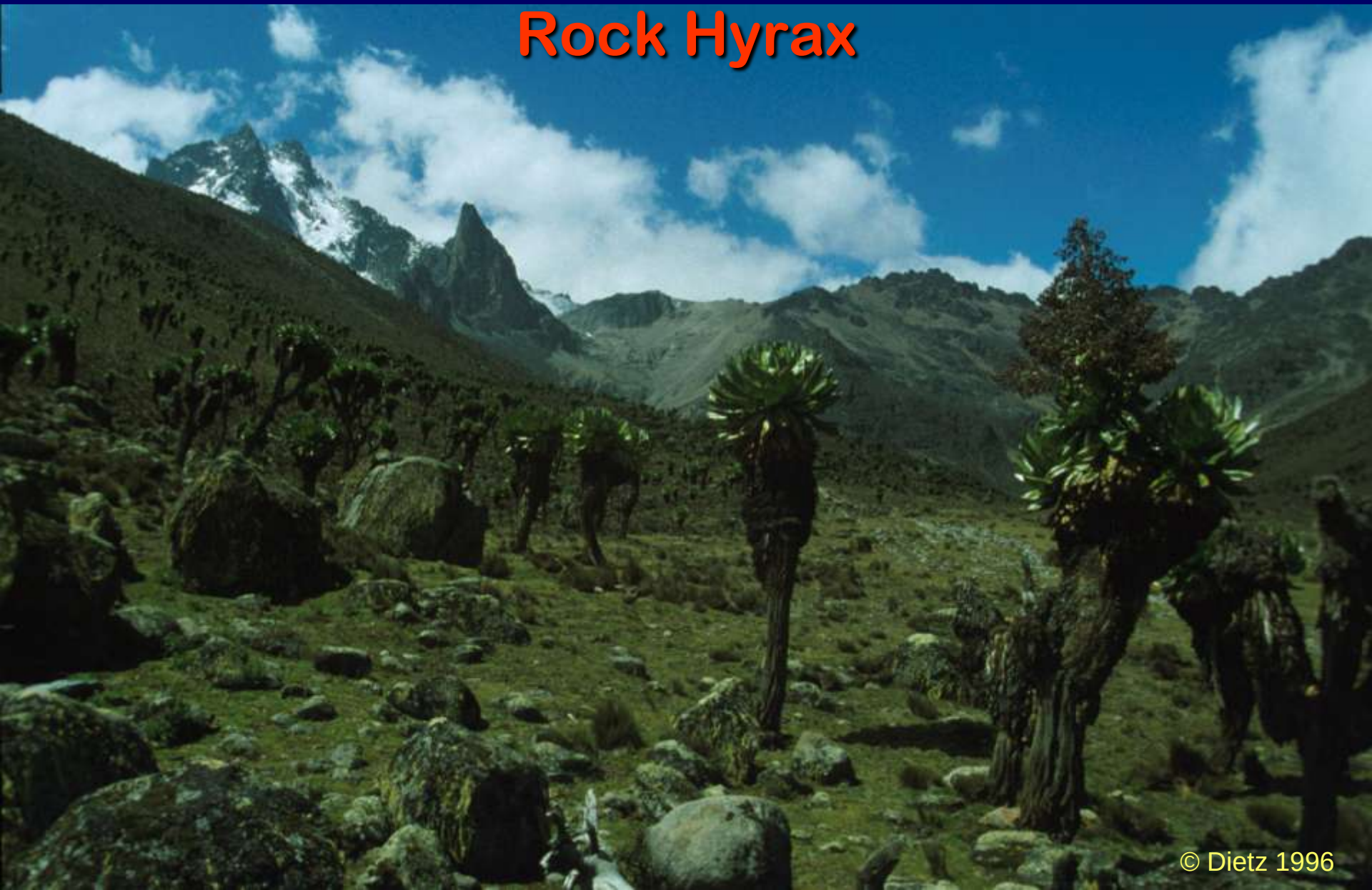
Rock Hyrax

- Dispersion: 3300 – 4800 m
- Nutrition: Mainly Monocotyles,

  Giant Rosette Plants
- Habitat: Dry Scree and Rock Piles
- Predators: Verreaux Eagle, Leopard

Herbivores

Rock Hyrax



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Herbivores

Rock Hyrax



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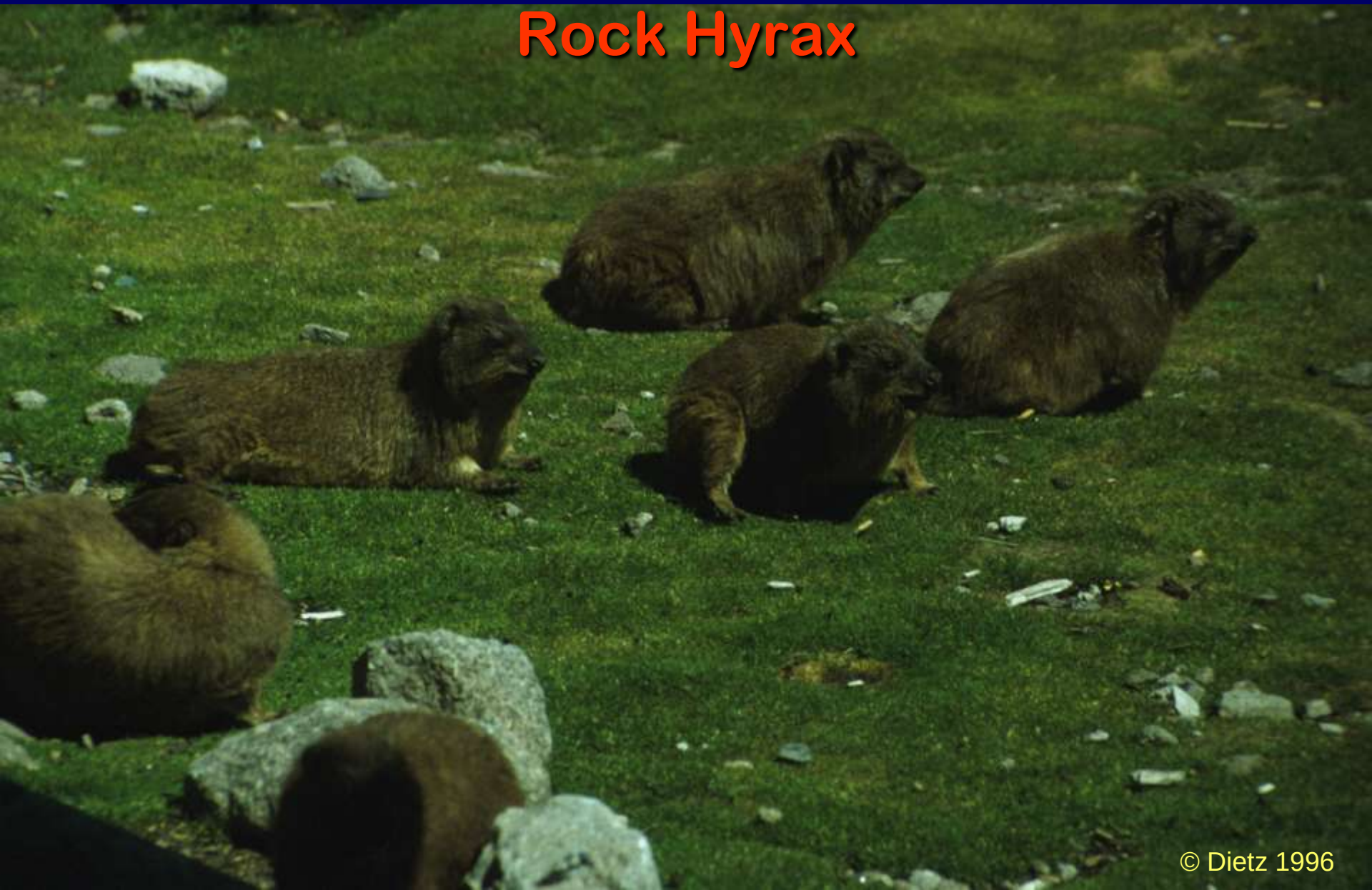
Herbivores

Rock Hyrax



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Herbivores

Rock Hyrax



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Damage of Vegetation

- Most affected:

  Vegetation in Rock Hyrax Habitats

  Senecio keniodendron

  Lobelia telekii

- Slow Development and Recovery
- Stressed Plants preferred
- Often Lethal Damage

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Damage of Vegetation

Senecio keniodendron

- Removal, Excavation of Insulating Leaf Rosette
- Gnawing through Leaf Midribs

  → Withering of Leaves
- Complete Browsing of Leaves



© Paulsch 1995

Damage of Vegetation

Lobelia telekii

- Browsing on Lower Parts of Inflorescence
- Removal of Latex-containing Rosette Leaves
- Complete Gnawing of the Stem
- Consumption of Pith
- Hazard: No Chance for Regrowth



Causes and Hazards

Drought

(Young 1984, 1985, 1994)

- Food Shortage
- Plants under Stress (Less Latex, smaller)

Causes and Hazards

Natural

(Coe 1957)

- Selective Pressure Historically Natural
- Many Plants Do Not Inhabit the Entire Potential Habitat
- *Senecio keniensis ssp. brassica* Migrates to Moister Habitats
- *Senecio keniodendron* Occurence at Greater Altitude

Causes and Hazards

Tourism

(Kokwaro & Beck 1987, Paulsch & Scholze 1998)

- Increased Waste Disposal
- Habituation to Man
- Deterrence of natural Predators
- Popuation Growth
- Discovery of Alternative Food Sources



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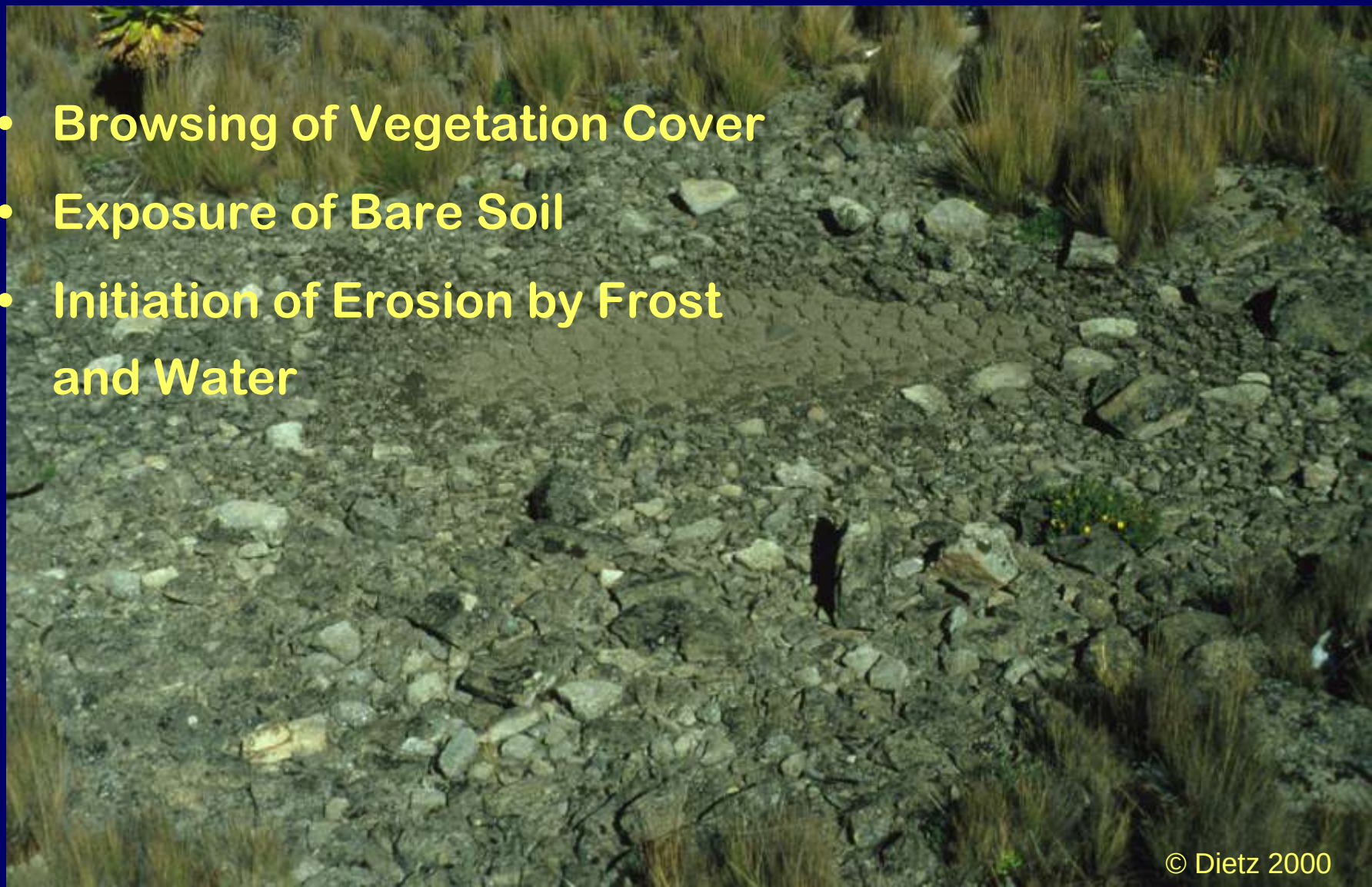
Causes and Hazards

Erosion



- Browsing of Vegetation Cover
- Exposure of Bare Soil
- Initiation of Erosion by Frost and Water

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Causes and Hazards

Erosion



- Browsing of Vegetation Cover
- Exposure of Bare Soil
- Initiation of Erosion by Frost and Water

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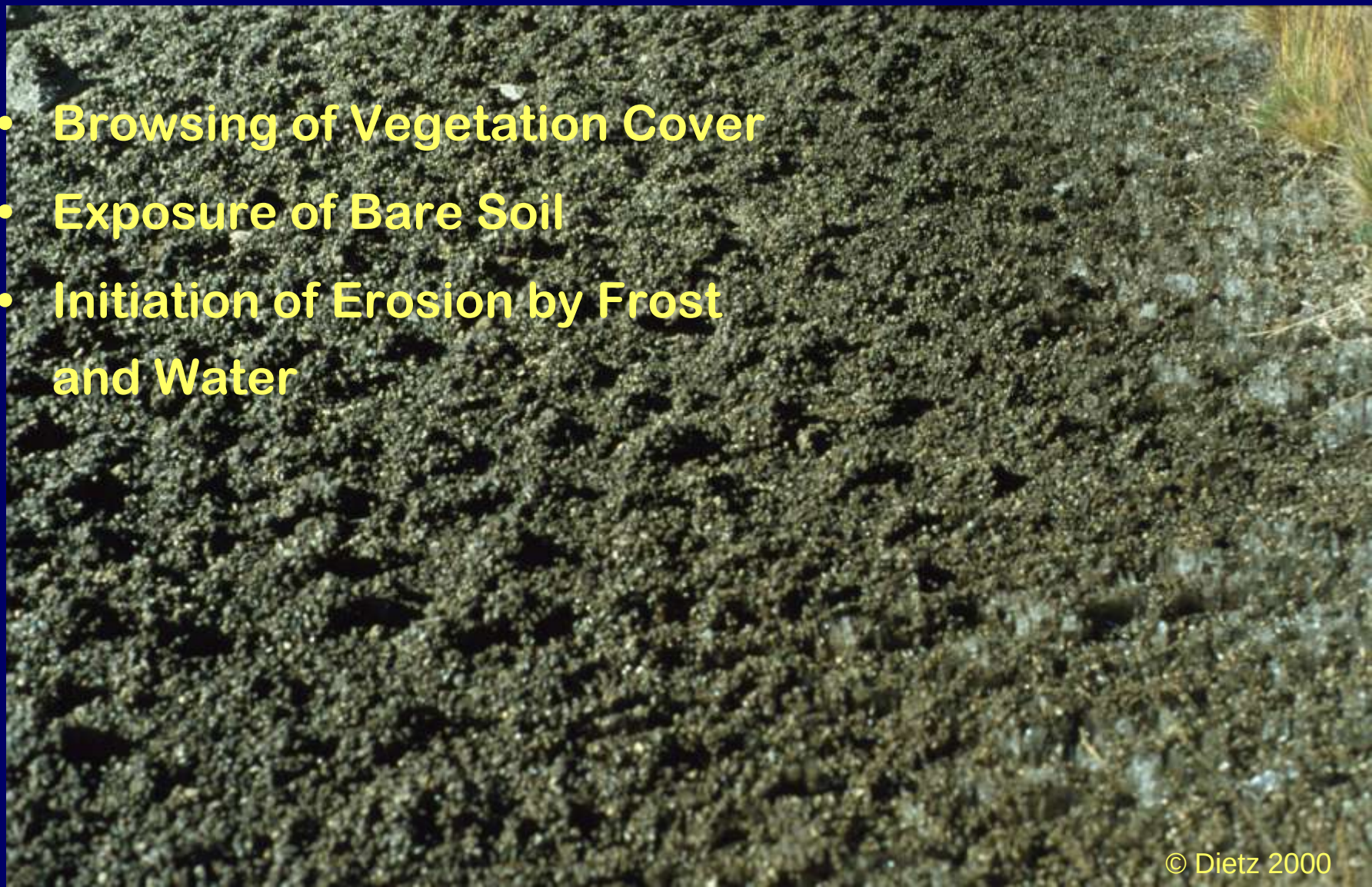
Causes and Hazards

Erosion



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Causes and Hazards

Erosion

- Browsing of Vegetation Cover
- Exposure of Bare Soil
- Initiation of Erosion by Frost and Water



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Conclusion

- Acute Danger to Unique Species of Mount Kenya Evident
- Different Hypotheses (mutually complementary)
- Human Influence Likely
- Measures Difficult, due to Sensitive Ecosystem

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