Resistance to Trypanocidal Drugs

Regional Workshop for OIE National Focal Points for Veterinary Products (5th Cycle)

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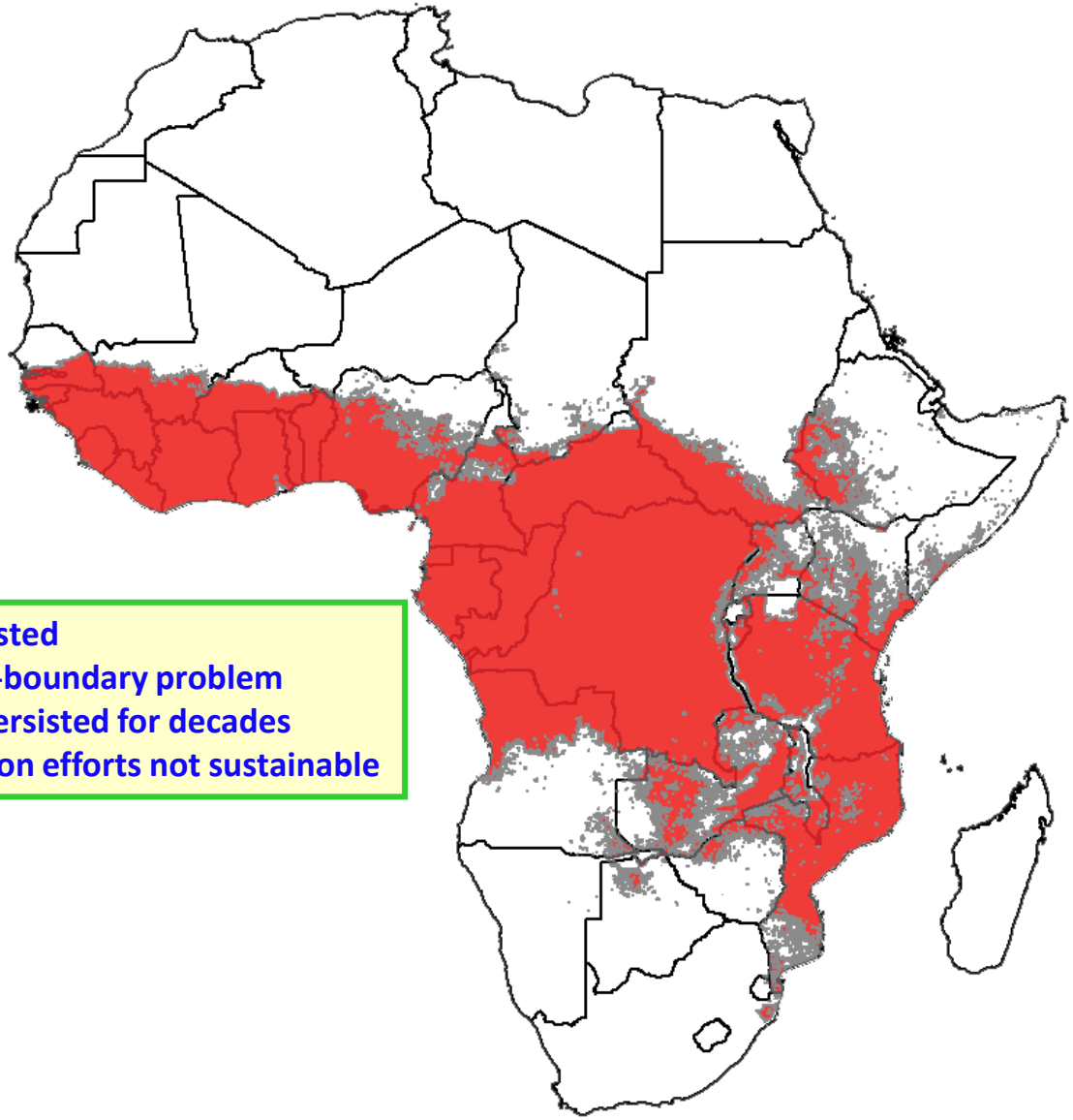
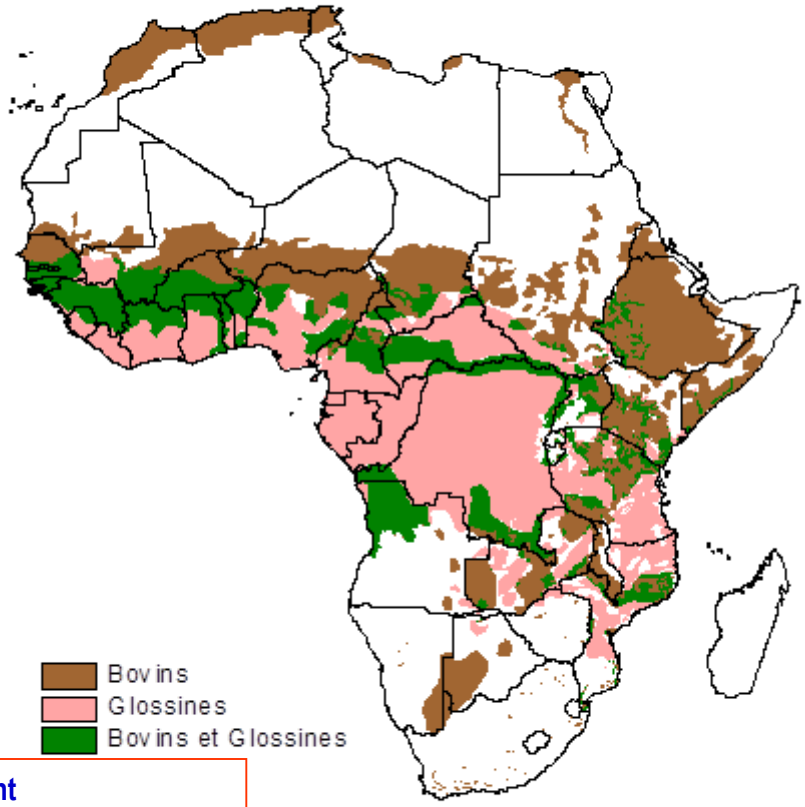
Gift Wanda – AU-PATTEC

Recap on T&T Challenge



- Vast areas infested
- Complex trans-boundary problem
- Problem has persisted for decades
- Past intervention efforts not sustainable

Recap on T&T challenge



- 10 m out of 170m cattle =>1/3 continent
- 3m livestock deaths annually
- $4.5 billion economic losses per year
- Land utilization / soil fertility, protein, mixed farming
- 35m doses of trypanocides per year

Main strategies for African Animal trypanosomosis (AAT) Control

- Vector avoidance/control/eradication
- **Use of curative and preventive trypanocidal drugs**
- Use of trypanotolerant breeds in tsetse infested areas

The place of trypanocidal drugs (TD) in AAT control

- Most applied method to treat or prevent AAT
- Represent a big share of vet drug market e.g. 20-40% in West Africa (Dia et al, 2004)
- Have proved to be effective from their early introduction
- Commonly available and relatively cheap (0.5 US$)
- Farmers can treat their animals without relying on the efforts of others

Available trypanocides for AAT

- Only three molecules currently available:
  - Dininazene
  - Isometamidium (ISMM)
  - Homidium
- All have been in use for at least 50 years
- Production of generics:
  - Diminazene (>20)
  - ISMM (2)
- High proportion of substandard products detected in Diminazene generics (Tettey, 2000) competing with quality drugs
- Very little likelihood to have new molecules in the near future

Benefits of trypanocides

- Trypano-susceptible zebu can survive and be productive in tsetse infested areas
- Redistribution of cattle has been possible through migration e.g. from Mali and BF to CAR; from Chad and Cameroon to Cote d'Ivoire
- Used to cure/protect cattle:
  - Zebu under permanent risk
  - Zebu under temporary risk (transhumant & commercial herds)
  - Can be used to treat cattle during critical periods and at vulnerable age (calves <3moths)

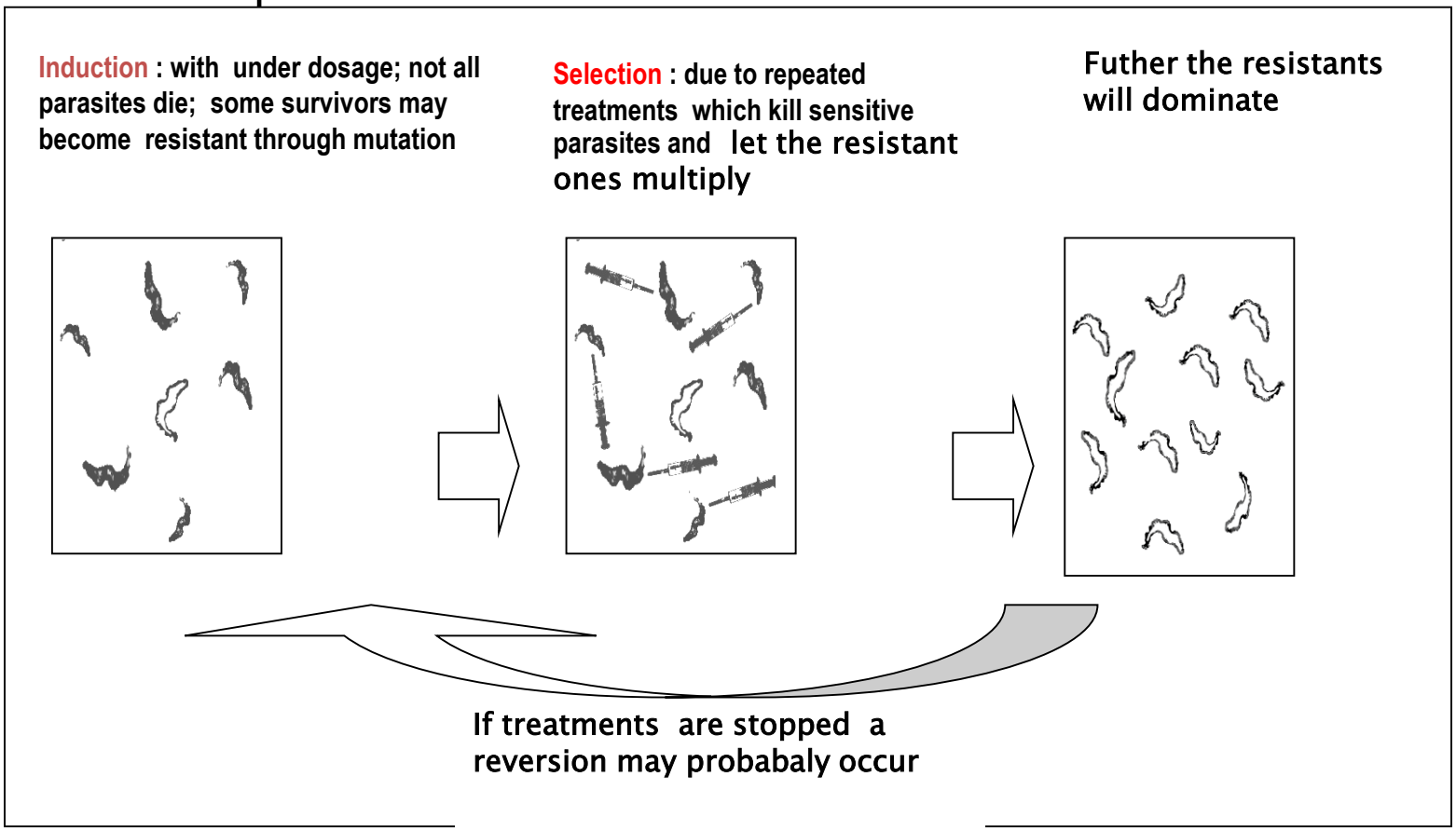
The challenge of resistance to trypanocides

- Reported in 18 African countries (Delespaux et al., 2008)
- Both ***T. vivax*** and ***T. congolense*** are affected (major causes of AAT in cattle)

Development of resistance to trypanocides

– Two main causes:

- Sub-therapeutic drug levels
- Frequent treatments



Drug use issues as cause of sub-therapeutic levels

- Excessive dilution during reconstitution
- Reduced dose to treat more cattle on economic reasons
- Underestimation of weight of animals
- Use of counterfeit products that have low content of genuine Trypanocide
- Presence of abscess at injection site =>hindering normal diffusion
- Too long interval between 2 prophylactic treatments
- Mass treatment of cattle and frequency

Practical aspects to minimize/delay resistance development

- Accurate diagnosis – confirm by microscopy
- Accurate animal weights/proper estimation
- Use TD immediately after reconstitution
- Follow guidelines for reconstitution
- Alternate use of trypanocides (curative and preventive)
- Symptomatic treatment
- Strategic use of trypanocides in accordance with level of risk e.g. in high tsetse challenge:
  - Integrated approach (vector control, reduce frequency of drug application (Fox *et al.,* 1993; Peregrine *et al.,* 1994)
  - Trypanotolerant cattle and drugs (Diall *et al.,* 1992)

Current opportunities to curb TD resistance

- International Alliance for Trypanocidal drugs quality control and assurance
  - UN organizations: FAO and IAEA
  - IFAH, MERIAL, CEVA, Intervet, LAPROVET
  - GALVmed
  - CIRDES and ITC (to join)
  - Stds and procedures developed by alliance with OIE support for three molecules
  - Two laboratories identified for TD quality control (LACOMED in Dakar for WA & CA and TFDA in Dar Es Salaam for EA and SA)
- Drug Resistance Management Initiatives
  - ILRI, ITM, CIRDES: have developed field and laboratory methods for the detection and surveillance of TD resistance
  - A Network for surveillance of Trypanosomes and Ticks resistance has been established in WA
  - ILRI has developed tools for rational drug use (ILRI/BMZ project (1992-2010))

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Thank you