Sodo Regional Veterinary Laboratory Prevalence and Associated Risk Factors of Bovine Trypanosomiosis in Gurage Zone Abishige Wereda, Snnnpr, Ethiopia

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Km² of arable land is infested with ve species of tsetse ies: namely Glossina pallidipes, G. m. submorsitans, G. fuscipes, G. tachinoides and G. longipennis (NTTICC [21]). According to Leta et al. [22], the prevalence of bovine trypanosomosis in Ethiopia range from 1.38 to 17.15 %. e most important trypanosome species a ecting livestock in Ethiopia are T. congolense, T. vivax and T. brucei in cattle, sheep and goats, T. evansi in camels and T. equiperdum in horses (Getachew [23]; Hagos [17]). In Ethiopia, the direct loss (mortality) due to trypanosomosis is estimated to amount 1.5 to 2 billion Birr per year (FAO [24]).

Statement of problem

In Gurage zone as a genearal and Abshege Wereda particular, trypanosomosis is one of the most important livestock diseases, which poses a serious threat to the lives and livelihood of entire communities and constitutes the greatest disease constraint to livestock production. To overcome the problem and to assess the epidemiology of trypanosomiosis, many researches are conducted previously in Gurage zone and surroundings by many researchers. ey found the causative factors of trypanosomiosis. So to know the current status of bovine trypanosomiosis in the area, the current study needed to conduct and to address epidemiology of trypanosomiosis.

Objectives

General objectives

A general objective of this study was to determine the overall prevalence of trypanosomiosis and its associated risk factors in cattle in study area.

Speci c objectives

- To estimate the prevalence of trypanosomiosis in study area
- To investigate associated risk factors that predisposes the occurrences of trypanosomiosis
- To identify species of trypanosoma from infected animals

Research questions

Trypanosomiosis raises several questions due to its etiological causes and associated risk factors. In this study trypanosomiosis has the following questions that should be solved accordingly a er the relevant research conducted.

- What is the overall prevalence of trypanosomiosis in the cattle in the study area?
- What are the major risk factors associated with the disease in the study area?
- What are the major species of trypanosomiosis that causes infection in cattle in the study area?

Signi cance of study/bene t and bene ciary/

Bovine trypanosomiosis exerts a great negative impact on the socio economic aspect especially for those of farmers' and private organizations whose income rely on ruminant production. So at the end, this research will identify the cause of the trypanosomiosis and associated risk factors. Subsequently the study will bene t farmers and small ruminant private organization by obtaining information pertinent to trypanosoma infection. e nding might also help to the researchers and as a baseline data for further researches activities. e study will generate data for policy makers, governmental and non-governmental organization to undertake and develop di erent prevention and control strategies.

Scope of study/delimitation/

e current study will play a great role in estimating the prevalence of bovine trypanosomiosis, identi cation of species and its associated risk factors in the study area. Generally, this research needs a wider agro-ecology, a seasonal variation, a large study population, species and breeds diversi cation to identify exact root cause and associated factors to the societies and the government as a whole. But some of this aim will not achieve due to many reason. Some of them are nancial shortage, a non-suitable agro-ecology for transportation and short study period.

Materials and Methods

Description of study area

e present study was conducted in Gurage zone Abeshege Wereda, in southwestern part of Ethiopia and 200 km away from the capital Addis Ababa (Figure 1). ese areas are collectively located between $37^0.52'.431''$ and $37^0.74'.235''$ East and between $7^0.96'.385''$ and $8^0.53'.347''$ North with altitude range from 1107-1923 meters above sea level (m.a.s.l.). e climate alternates with long summer rain fall (June-

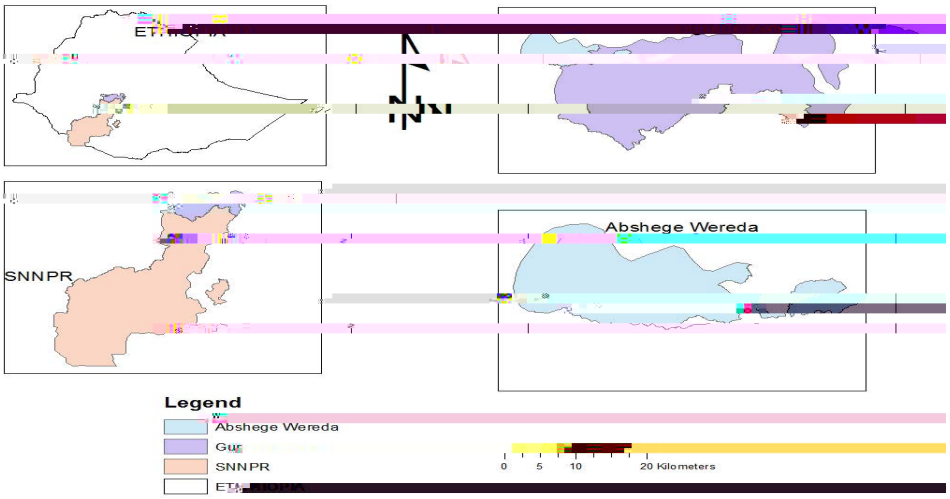

Figure 1: Map displaying study area.

September) and a winter dry season (October-May). e area receives a mean annual rainfall of 900 mm and the mean monthly maximum temperature ranging between 29.8^{0}C and 44.0^{0}C. e study sites are composed of cultivated land, grazing land, forest shrub, bush and wood land, water bodies and rural and urban settlement areas. ese areas have the same altitude, same tsetse challenge and are adjacent to Ghibe River. e livestock population includes cattle, sheep, goats and equines which are an integral part of the livelihood. Mixed crop-livestock farming is the main source of livelihoods where Maize, Te and hot-pepper are the main cash crops. e whole Gurage zone lie south west of the capital and are generally within the tsetse belt with relatively medium to high y challenge.

Study population

e study animals were local breed of cattle which selected from study area that managed in extensive management system and consisting of di erent age, sex and body condition and will be selected from 4 purposely selected rural kebeles. During sampling, age, sex, and body conditions of the animals will be recorded. According to Gatenby [25] (1991) and Steele [26] the body condition scoring of animal classi ed as poor, medium and good and the age of animals will estimated through dentition and categorized as young (< or = to one years) and adult (> than one years).

Study design

Cross-sectional study design was carried out from January 2021 to June 2021 to estimate the prevalence and associated risk factors of bovine trypanosomiosis.

Sampling technique

Sampling techniques was used in this study are purposive sampling and simple random sampling technique. In purposive sampling technique, Wereda and study kebeles namely Ghibe, Borer, Hudad Arat, and Tawula Gefersa are selected based on transport access and animal population numbers. In simple random sampling technique animals will sample from selected kebeles.

Sample size determination

For estimation of the disease prevalence, the sample size was determine by assuming the expected prevalence to be 50%, the statistical con dence level 95%, while the desired precision taken is 5%. According to rusts eld (2018) formula the sample size calculated as the following.

$$n = \frac{Z^2 Pexp.(1-Pexp)}{d^2}$$

Where: n = required sample size; Pexp = expected prevalence; d = desired absolute precision (5%). According to the above formula, the calculated sample size was 384. To increase precision and also to be representative, sample size was approximately in ated 2 times. erefore, the total sample size required for this study was 623. Due to di erence in cattle population in 4 selected kebeles, the sample size allocated proportionally based on number of cattle population.

Parasitological data collection

Packed cell volume (PVC) determination

A er well straining of animal in the eld, blood will collected from an ear vein into heparineized micro-haematocrit capillary tubes. Each capillary tube will lled to its last third and sealed with crystal seal at one end and centrifuge immediately in a micro heamatocrite centrifuge for ve minute at 1500rpm. A er centrifugation, the capillary tubes are placed in a haematocrit reader. e length of the packed red blood cells column is expressed as a percentage of the total volume of blood. en the packed cell volume (PCV) will determined. Animal with PCV less than or equal to 24% are considered to be anemic (Radostitis et al. [27]).

Bu y coat technique

In Bu y Coat technique, blood will collected from an ear vein using heparinized micro-haematocrit capillary tube and the tube will sealed. A heparinized capillary tube containing blood will centrifuged for 5 minutes at 12, 000 rpm. A er centrifugation, tryponosomes are usually found in or just above the bu y coat layer. e capillary tube will cut using a diamond tipped pen 1mm below the bu y coat to include the upper most layers of the red blood cells and 3mm above to include the plasma. e content of the capillary tube will expressed onto a slide and covered with cover slip. e slide will examined under x40 objective and x10 eye piece for movement of parasite. Trypanosome species are identi ed according to their morphological descriptions as well as movement in wet lm preparations provided by OIE (OIE [28]).

in blood smear

A small drop of blood from a micro haematocrit capillary tube will applied to a clean slide and spread by using another clean slide at an angle of 45°. e smear was dried by moving it in the air and xed for 2 minutes in methyl alcohol. e thin smear will ood with Giemsa stain (1:10 solution) for 30 minutes. Excess stain will drain and washed by using distilled water. en it will allow drying and examined under the microscope (x100) oil immersion objective lens (OIE [28]).

Data management and analysis

e well-organized data and result of parasitological examination will be entered and managed in MS Excel work sheet and analyzed by using STATA version 14.2. e prevalence will summarized by using descriptive statistics and association of bovine trypanosomiosis prevalence with di erent potential risk factors such as age, sex, and body condition score will analyzed by chi-square. A p value of 5% is used as cut o for statistical signi cance at 95% 1slyzed]TJ-0.023 Tw TeR21 Tv

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variation. e current study also tried to indicate the di erence between me

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