Acaricidal Activity of Essential Oils from Leaves of *Chromolaena odorata* (L.) King & Robins., *Eucalyptus saligna* Smith. & *Chenopodium ambrosioides* on Ticks (*Rhipicepha luslunulatus* Neumann, 1907) of West African Dwarf Goats (WADG) in Cameroon

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Introduction Goat population in Cameroon is estimated at 3,760,000.However,their productivity is severely limited by malnutrition and diseases,including ectoparasites infestations.Standard synthetic compounds have been used to control ticks in the region but limited resources,high cost and the development of resistance restricts their use by poor farmer.Alternative anti-tick strategies are therefore required.Extracts of many plants are known to have wide ranges of biological activities (Kuiate, 1993) which if effectively used can reduce the fatal effects of these parasites on animals.This study was carried out to evaluate the bioactivity of essential oils from the leaves of *C.odorota* (CO) *E.saligna* (ES) and *C.ambrosioides* (CA) on *R.lunulatus* (RL) of WADG in Cameroon.

Materials and methods Fresh leaves of CO,ES and CA plants were harvested and sun dried for 3 days.Extractions of the essential oils were accomplished separately through hydrodistillation and the chemical compositions determined as by Kuiate, (1993).The oils obtained were stored in the dark at 4±1℃.Two hundred RL ticks,identified as described by Walker *et al*. (2002),collected from WADG in Dschang area without breaking their rostrum were weighed (average:0.5g) and their length (6.5 mm) measured.These two parameters were used as reference measure for the choice of ticks used in the tests.Five doses of the dehydrated extracts prepared by diluting 0;5;10;20 and 40 μl separately in 1 ml of chloroform solvent were used. Round filter papers were soaked with each solution and placed in fitting clean dry Petri dishes,with 4 replicates each at room temperature (24℃),to obtain the following doses:0;0.079;0.157;0.314 and 0.629 μl/cm^2.Ten ticks having the above reference size were randomly placed in each petri dish and covered.The plates were examined each morning over a period of 8 days and dead ticks were counted and removed.The mortality rate of the tick was calculated as per Abbot (1925) as follows: $Mc = \frac{Mo-Mt}{100-Mt}$,where Mc=accrued and corrected death rate;Mo=death rate in treated group;Mt=death rate in the control (natural mortality).The cumulative and corrected mortality percentages were analysed by ANOVA (Steel and Torrie,1980) and the differences between the treatments were analysed by the Student t" test.The logarithmic regression of the dose according to mortality was used to determine the lethal dose 50 (LD_{50}).

Results The yields of extraction of essential oils were 0.06%;0.70% and 0.85% from the leaves of CO,CA and ES respectively.Chemical analysis showed that the principal compositions of the essential oils from the leaves were Bicyclogermacrène (12.55%),Géigérène (11.85%),α-Pinène (9.36%) and (Z)-β-Farnesène (9.98%) for CO,α-Pinène (29.5%),γ-Terpinéol (9.61%) and p-Cymène (9.09%) for ES and p-Cymène (65.16%),Limonène (17.10%) and Ascaridole (10.76%) for CA.All the 4 concentrations tested in this study showed anti-tick effects but with significant differences ($P<0.05$) between treatments.The efficacy increased with increase in concentration of the essential oils and duration of exposure.The essential oil from the leaves of CA was always most ($P<0.05$) toxic to the ticks followed by the oils from CO and ES.The mortality in the control group were recorded from day 6 and was always significantly lower ($P<0.05$) compared to the other treatment groups and the important chemical constituents in the essential oils were observed to be the toxic ingredients. Following the transformation of the mortality percentages to probits,the regression lines revealed that the LD_{50} were:0.053;0.079 and 0.120 μl/cm^2 for the essential oils from CA,CO and ES respectively.

Conclusions The essential oils of CA,CO and ES are toxic to *R.lunulatus* ticks.The LD_{50} obtained in this work showed that the essential oil from the leaves of CA (0.053μl/cm^2) is most toxic followed by those from CO (0.079μl/cm^2) and ES (0.120 μl/cm^2) suggesting a potentially high efficiency against *R.lunulatus* ticks.

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