The Potential Use of Natural Essential Oils in Prevention from Ticks of Dermacentor and Haemaphysalis Genus

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The aim of our study was to investigate a repellent effect of 13 essential oils of plants on ticks of Dermacentor reticulatus (Meadow tick) – transporter of fatal babesiosis of dogs and tularemia and Haemaphysalis inermis (Winter tick) – transporter of tick-borne encephalitis. With dilution of essential oils with 96% ethanol, ginger had the lowest volatility after 3 hours (49.9%) and eucalyptus had the highest (99.3%). From essential oils diluted with a mixture composed of 96% ethanol and 85% glycerol in ratio 1:1, fennel had the lowest volatility (16.1%) and lavender had the highest (36,6%). 11.02 times higher repellent effect than the commercial repellent was proved in essential oil from patchouli. Higher repellent effect than repellent was proved in oils from nutmeg, anise, ginger and bergamot (230.8 – 111%). Natural essential oil from patchouli showed the highest efficacy compared to the commercial repellent (1342.5%) in dilution with 85% glycerol and 96% ethanol. Effectivity higher than the commercial repellent was also proved in essential oils from fennel, nutmeg, anise, myrtle, ginger, lavender, bergamot and mint (392 – 104.3%). In investigation of repellent effect of combination of selected essential oils on ticks of Dermacentor genus, the highest efficacy (388.8%) was shown in combination of patchouli, fennel and nutmeg. On ticks of Haemaphysalis genus, the highest effectivity after 30 minutes in comparison with repellent was proved in combination of patchouli and nutmeg (228.9%) diluted in ratio 1:1 with 96% ethanol and 85% glycerol. The highest effectivity after 3 hours was proved in patchouli (171.9%). Oil from patchouli showed the highest effectivity after 6 hours (112.4%) and also after 12 hours (105.1%).

Awards Won:

Second Award of $2,000

China Association for Science and Technology (CAST): Award of $1,200