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UNIVERSIDADE ESTADUAL PAULISTA
FACULDADE DE MEDICINA VETERINÁRIA E ZOOTECNIA
CAMPUS DE BOTUCATU

POTENCIAL ANTIBACTERIANO DOS ÓLEOS ESSENCIAIS DE *Melaleuca alternifolia*,
Mentha piperita e *Rosmarinus officinalis* EM ISOLADOS DE *Staphylococcus*
pseudintermedius

JÚLIA MEIRA

Botucatu - SP

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de Pós-graduação em Medicina Veterinária
para obtenção do título de Mestre.

Orientador: Prof. Dr. Luiz Henrique de
Araújo Machado

Coorientador: Prof. Dr. Adriano Sakai
Okamoto

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Coorientador: Adriano Sakai Okamoto

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COMISSÃO EXAMINADORA

Prof. Dr. Luiz Henrique de Araújo Machado
Orientador
Departamento de Clínica Veterinária
FMVZ – UNESP – Botucatu

Dra. Ana Flávia Marques Pereira
Membro
Departamento de Ciências Químicas e Biológicas
IBB – UNESP – Botucatu

Profa. Dra. Marcy Lancia Pereira
Membro
Departamento de Biociências e Saúde Única
UFSC – Curitibanos

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LISTA DE ABREVIATURAS

BHA	Brain Heart Infusion Ágar
BHI	Brain Heart Infusion
CBM	Concentração Bactericida Mínima
CEUA	Comissão de Ética no Uso de Animais
CIM	Concentração Inibitória Mínima
CL	Clavulanato
MDR	Multidrug-resistant
MHC	Mueller Hinton Caldo
MRS	<i>Staphylococcus</i> resistente à meticilina
MRSP	<i>Staphylococcus pseudintermedius</i> resistente à meticilina
MSSP	<i>Staphylococcus pseudintermedius</i> suscetível à meticilina
OE	Óleo Essencial
OEs	Óleos Essenciais
PBP2a	Proteína de ligação da penicilina
PCR	Polimerase Chain Reaction
SCC	Staphylococcal Cassette Chromosome
SIG	Staphylococcus Intermedius Group
TTO	Tea Tree Oil

LISTA DE SÍMBOLOS

%	Porcentagem
°C	Graus Celsius
H	Hora
mg	Miligramma
min	Minuto
ml	Mililitro
µg	Micrograma
µl	Microlitro

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RESUMO

A bactéria *Staphylococcus pseudintermedius* é um agente oportunista relacionado à piodermite canina e está presente em folículos pilosos. Além disso, é considerada a principal causa da uso de antibióticos em pequenos animais. O isolamento de *S. pseudintermedius* resistente à meticilina (MRSP) vêm sendo relatado frequentemente na rotina clínica veterinária de pequenos animais e o uso de óleos essenciais (OEs) tornou-se uma alternativa terapêutica. O objetivo deste estudo foi avaliar se óleos essenciais possuem efeito antibacteriano sobre isolados de *S. pseudintermedius* resistente e suscetível à meticilina, originados de animais com piodermite canina. Foi utilizada a técnica de microdiluição seriada para obter a concentração inibitória mínima (MIC). Diferentes concentrações foram utilizadas (31.25 to 64000 µg/mL). Os valores de MIC dos OEs de *Melaleuca alternifolia*, *Mentha piperita* e *Rosmarinus officinalis* sobre o isolado MRSP foram 10667 µg/mL, 32000 µg/mL e 42666 µg/mL, respectivamente. Dentre os OEs, o de *M. piperita* mostrou o menor valor de MIC (5333 µg/mL) e o OE de *M. alternifolia* o maior valor de MIC (37333 µg/mL) sobre o isolado MSSP. Os OEs apresentaram atividade antibacteriana *in vitro* e podem ser considerados como alternativas terapêuticas, porém devem ser realizados mais estudos em condições *in vitro* e *in vivo*.

Palavras-chave: MRSP, piodermite canina, resistência bacteriana, tea tree oil, terpenos

MEIRA, J. **Antibacterial potential of essential oils from *Melaleuca alternifolia*, *Mentha piperita* e *Rosmarinus officinalis* against *Staphylococcus pseudintermedius* isolates.** Botucatu, 2023. 51p. Dissertação (Mestrado) – Faculdade de Medicina Veterinária e Zootecnia, Campus de Botucatu, Universidade Estadual Paulista (UNESP).

ABSTRACT

Staphylococcus pseudintermedius is the main opportunistic agent related to canine pyoderma, composing the natural microbiota of hair follicles. It is considered the main cause of the use of antibiotics in small animals. Reports of methicillin-resistant *S. pseudintermedius* (MRSP) has become frequent in veterinary clinical routine of small animals. Essential oils (EOs) has been studied and become a therapeutic alternative. The *in vitro* antibacterial activity of EOs against MRSP isolates and methicillin-susceptible *S. pseudintermedius* (MSSP) was evaluated. Assays were performed using the broth microdilution assay aiming for minimum inhibitory concentrations (MIC). Different concentrations of the essential oils were placed (31.25 to 64000 µg/mL). The MIC values of the EOs from *Melaleuca alternifolia*, *Mentha piperita* and *Rosmarinus officinalis* against MRSP isolate were 10667 µg/mL, 32000 µg/mL, and 42666 µg/mL, respectively. Among the oils, *M. piperita* EO showed the lowest MIC value (5333 µg/mL) and EO from *M. alternifolia* showed the highest MIC value (37333 µg/mL) against MSSP. Therefore, the antibacterial effectiveness of the EOs can be considered for further therapeutic use. However, more studies must be conducted *in vitro* and *in vivo* condition.

Keywords: MRSP, canine pyoderma, bacterial resistance, tea tree oil, terpenes

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Keywords: MRSP, canine pyoderma, bacterial resistance, tea tree oil, terpenes

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Conclusões finais

Ainda são escassos os estudos avaliando a eficácia antibacteriana de OEs sobre isolados de *S. pseudointermedius*. Nesse estudo observamos que os valores obtidos de MIC e MBC demonstram que os óleos essenciais possuem efeito antibacteriano sobre os isolados, porém há a necessidade de estudos que comprovem os seus efeitos em condições *in vivo*. Concluiu-se que os óleos essenciais de *M. alternifolia*, *M. piperita* e *R. officinalis* possuem atividade antibacteriana sobre os isolados MRSP e MSSP e podem ser fontes promissoras de terapias alternativas ou complementares no tratamento da piodermite canina. Contudo, são necessários mais estudos *in vitro* e *in vivo* avaliando diferentes concentrações, tipos e compostos de OEs além da possível sinergia entre produtos naturais e antimicrobianos convencionais.

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