



Bacterial endoftalmitis caused by *Serratia* sp. in a bunny (*Oryctolagus cuniculus*)

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1 INTRODUCTION

Bacterial endophthalmitis is a rare inflammation (TANAKA, 2019) that causes destruction and necrosis (TANAKA et al., 2011) of the structural components of the eyeball, through the penetration of infectious agents (JAIN et al., 2009; TIECCO et al., 2022) to the posterior segment of the eye, mainly after intraocular surgeries (CARVALHO et al., 2017; TRAD et al., 2022), 2022) to the posterior segment of the eye, mainly after intraocular surgeries (CARVALHO et al., 2021), trauma and systemic diseases (DURAND, 2017; TRAD et al., 2018; PUJARI et al., 2022), leading to vision loss (COELHO et al., 2015) and in more severe cases, enucleation (JACKSON, T. L. et al., 2014; JACKSON, TIMOTHY L. et al., 2014).

The main clinical signs are blepharospasm, blepharedema, conjunctival hyperemia, corneal edema, hypopyon and conjunctival discharge, and corneal ulcer may occur (NES, 2018; WINARTI et al., 2021; AGRAWAL, 2022; XIE et al., 2022). Culture (BARBOSA et al., 2017; CAIADO et al., 2020) and histopathological analysis (NEVES et al., 1990; GALERA et al., 2017) are diagnostic methods used for pathogen identification and confirmation of endophthalmitis (MEREDITH et al., 1990; SCHIRMBECK et al., 2000; GUERRA et al., 2012).

It is a disease of difficult treatment, which is usually performed through the association of broad-spectrum antimicrobials with topical and systemic corticosteroids, in addition to supportive treatment (CIULLA et al., 1999; TANAKA et al., 2019; PINTO et al., 2020; SINGH et al., 2022).

2 OBJECTIVE

To report a case of bacterial endophthalmitis caused by *Serratia* sp. in a domestic rabbit (*Oryctolagus cuniculus*) treated in a veterinary ophthalmology service.



3 METHODOLOGY

Literature Search Method

We searched for articles in the literature written in English and Portuguese, as well as English translations of articles in other languages with the combination of keywords, *Serratia*, rabbit, endophthalmitis and gatifloxacin, in Medline, Lilacs, OPAS and SciELO through Google Scholar and by direct search, without temporal clipping, with refinement to the last five years, when possible.

Individual case reports, case series and literature reviews on *Serratia* sp. induced endophthalmitis in all species were selected. Cross-references of those articles not highlighted in the cited research databases were also obtained and reviewed.

Case Report

This case report used information from the care records, history and medical records of a case attended by the veterinary ophthalmology mobile service. Animal models, experiments or any other intentional intervention in animals other than those described here were not used during the specialized clinical care. The person responsible for the animal authorized the disclosure of information and images for scientific dissemination purposes, respecting ethical criteria regarding personal information.

A domestic rabbit, *Oryctolagus cuniculus*, an uncastrated male, aged 3 years and 7 months, was treated at the mobile veterinary ophthalmology service in Brasília, Federal District, Brazil.

The patient had a history of possible perforating trauma to the left eye (LE) and at the time of consultation presented with blepharospasm, blepharedema, conjunctival hyperemia, corneal edema, serous secretion and hypopyon (figure 1).

Figure 1. Clinical photograph of the left eye of *Oryctolagus cuniculus* showing blepharospasm, blepharedema, conjunctival hyperemia, corneal edema, serous discharge and hypopyon.





During anamnesis, the guardian described the patient's history. According to him, the animal was already on previous systemic treatment with Enrofloxacin and Meloxicam. Unfortunately, the guardian could not inform the dosage or dosage of each drug.

In the ophthalmologic examination, the pupillary reflex, threat test and walking test were positive in both eyes (AO). The Schirmer tear test (SLT) (NASCIMENTO, 2019; DIAS et al., 2020; BORGES et al., 2021) was performed only in the right eye (RE) with a result of 3mm/min. The fluorescein test was positive and the Seidel test was negative for RE (DÍAZ BARRÓN et al., 2020; SEVILLANO et al., 2020; BASTOS et al., 2021).

Tonometry was performed with TonoVet® Plus (GLOE et al., 2019) to measure intraocular pressure (IOP), which resulted in 34mmHg for EW and 15mmHg for OD. CBC (Figure 2) revealed erythrocytosis, hyperproteinemia, relative monocytosis and presence of reactive lymphocytes (antigenic stimulation).

Figure 2 - CBC showing erythrocytosis, hyperproteinemia, relative monocytosis and presence of reactive lymphocytes.

Data Entrada...: 26/01/2021

Nome: GUCCI
Especie.....: COELHO
Sexo.....: MACHO
Prop.: RENATA

Raça...:COELHO
Idade...: 1 Ano(s) Mes(es) Dia(s)
Médico Vet...: HANS REUTER
Clínica Vet...: EXOTIC LIFE

HEMOGRAMA COELHO

Eritrograma

		VALORES DE REFERÊNCIA	
Hemácias	8,45	4,0 - 8,0 x10 ¹² /ul	
Hemoglobina	17,23	8 - 17 g/dl	
Volume Globular	54,00	30 - 50 %	
VCM	63,90	38 - 55 fl	
CHCM	31,90	28 - 37 %	
PPT	8,8	6 - 8 g/dl	
Metarrubricitos	0	0	

Eritrocitose
Hiperproteinemia

Leucograma

		VALORES DE REFERÊNCIA	
		Relativo	Absoluto
Leucócitos Totais	8,600 /mm ³		5,200 - 12,500/uL
Mielócitos	0 0,000	0%	0/uL
Metamielócitos	0 0,000	0%	0/uL
Bastonetes	0 0,000	0%	0/uL
Heterófilos	67 5,762	20 - 75 %	1,040 - 9,375/uL
Linfócitos	28 2,408	30 - 55 %	1,560 - 10,625/uL
Eosinófilos	0 0,000	0 - 4%	0 - 500/uL
Monócitos	5 0,430	0 - 4%	0 - 500/uL
Basófilos	0 0,000	0 - 7%	0 - 875/uL

Monocitose relativa
Presença de linfócitos reativos (estimulação antigénica)

Plaquetas 512.000 250 a 650 mil/uL

Presença de agregado plaquetário na amostra



Then, corneal material was collected with a swab (LEAL et al., 2021) in Stuart medium (STUART, 2020) for culture (LEBER, 2020) and antibiogram by the disk-diffusion method (BALOUIRI et al., 2016; CHIN et al., 2023). The clinical suspicion was intraocular abscess and the clinical diagnosis was uveitis and traumatic glaucoma. Treatment was initiated with Moxifloxacin eye drops (5.45mg/ml) every 4 hours for 7 days, and every 6 hours for another 10 days, EDTA 0.35% every 6 hours and Dorzolamide (20mg/ml), every 6 hours. After 15 days, the patient returned for reassessment, where it was seen that the EO showed intense neovascularization, negative fluorescein, cornea in keratoconus aspect, IOP 25mmHg and negative pupillary reflex (Figure 3).

Figure 3 Clinical photograph of the EO of *Oryctolagus cuniculus* showing intense neovascularization, keratoconus and negative pupillary reflex.



In view of the symptoms, an intrastromal abscess was suspected. To investigate this suspicion, ocular ultrasonography was requested, which was not authorized by the guardian. Culture and antibiogram (BELL; SMITH, 1975) of material collected from the cornea were performed. As a result, *Serratia* sp. was isolated with sensitivity to Ciprofloxacin, Chloramphenicol and Meropenem (Figure 4).

Figure 4 - Results of the culture of the material collected from the cornea of *Oryctolagus cuniculus* with isolation of *Serratia* sp. and antibiogram with sensitivity to Ciprofloxacin, Chloramphenicol and Meropenem.

Data Entrada...: 29/01/2021

Nome	GUCCI	Raça...:	COELHO
Especie.....	COELHO	Idade...:	3 Ano(s) Mes(es) Dia(s)
Sexo.....	MACHO	Médico Vet...:	NÃO INFORMADO
Prop.	RENATA	Clínica Vet...:	EXOTIC LIFE

IDENTIFICAÇÃO BACTERIANA E ANTIBIOGRAMA

Material analisado: Cornea

Resultado

Microorganismo isolado: *Serratia* sp.

Antibiograma - Teste de sensibilidade a antimicrobianos

Meropenem	.....	26 mm	Sensível
Ciprofloxacina	.....	25 mm	Sensível
Cloranfenicol	.....	18 mm	Sensível
Neomicina	.....	14 mm	Intermediário
Doxiciclina	.....	13 mm	Intermediário
Enrofloxacina	.....	13 mm	Resistente
Tobramicina	.....	9 mm	Resistente
Amoxicilina	.....	0 mm	Resistente
Amox + Clavulanato	.....	0 mm	Resistente
Cefalexina	.....	0 mm	Resistente



The therapeutic approach was adjusted, starting treatment with Gatifloxacin eye drops (3mg/ml) associated with Prednisolone (10mg/ml), every 6 hours, for 7 days, maintaining Dorzolamide (20mg/ml), every 6 hours. After 30 days of appropriate treatment, there were no significant changes in the blood count (Figure 5) and, therefore, the patient was submitted to the enucleation procedure.

Figure 5 - CBC taken 30 days after adjusted treatment showing erythrocytosis, hyperproteinemia and relative monocytosis.

Data Entrada...: 12/03/2021

Nome: GUCCI
 Espécie.....: COELHO
 Sexo.....: MACHO
 Prop.: RENATA

Raça...:COELHO
 Idade...: 3 Ano(s) Mes(es) Dia(s)
 Médico Vet...: HANS REUTER
 Clínica Vet.: EKOTIC LIFE

HEMOGRAMA COELHO

Eritrograma

		VALORES DE REFERÊNCIA
Hemácias	8,12	4,0 - 8,0 x10 ⁶ /ul
Hemoglobina	17,40	8 - 17 g/dl
Volume Globular	51,00	30 - 50 %
VCM	62,80	58 - 65 fl
CHCM	34,11	28 - 37 %
PPT	9,2	6 - 8 g/dl
Metarrubríctos	0	0

Eritrocitose
 Hiperproteinemia

Leucograma

			VALORES DE REFERÊNCIA
		Relativo	Absoluto
Leucócitos Totais	8,900 /mm ³		5,200 - 12,500/uL
Mielócitos	0 0,000	0%	0/uL
Metamielócitos	0 0,000	0%	0/uL
Bastonetes	0 0,000	0%	0/uL
Heterófilos	57 5,073	20 - 75 %	1,040 - 9,375/uL
Linfócitos	35 3,115	30 - 85 %	1,560 - 10,625/uL
Eosinófilos	3 0,267	0 - 4%	0 - 500/uL
Monócitos	5 0,445	0 - 4%	0 - 500/uL
Basófilos	0 0,000	0 - 7%	0 - 875/uL

Monocitose relativa

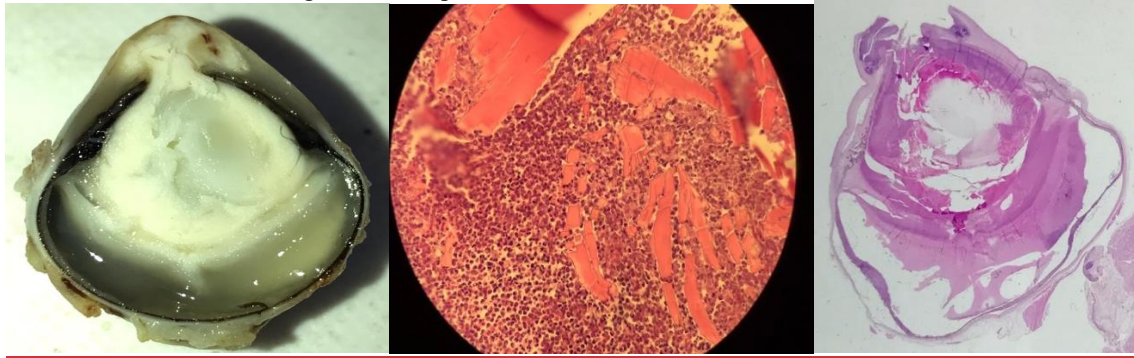
Plaquetas 336.000 250 a 650 mil/uL

Presença de agregado plaquetário na amostra

Before surgery, during induction of anesthesia, the patient presented cardiorespiratory arrest due to probable sepsis. Resuscitation maneuvers were performed, but the patient did not respond and died shortly after. Enucleation was then performed to collect a corneal sample. The sample was sent for histopathologic diagnostic examination. The histopathology result was endophthalmitis with intralenticular abscess (Figure 6).



Figure 6: Endophthalmitis with intralenticular abscess.



4 DISCUSSION

The bacterium *Serratia* sp. is a rod (GRIMONT; GRIMONT, 1978; BIEDENBACH et al., 2004), Gram negative (SADER et al., 2014; SARALEGUI et al., 2020), from the Enterobacteriaceae family (SOENENS; IMPERIAL, 2020; CASTRO-SAINES et al., 2022), saprophytic (HOFF, 1984; PAGANINI et al., 2021) opportunistic (NARENDRA KUMAR et al., 2023), described as causing nosocomial infections (FOX et al., 1981; MATSUSHITA et al., 2009), mainly in cases of pneumopathies (POOLE; CLARK, 2020; WALTERS et al., 2022), still little described in veterinary medicine (KECK et al., 2020).

Even so, there are already studies that point out the genus *Serratia* causing experimental infection and/or disease in an induced way, in nematodes (PRADEL et al., 2007), guinea pigs (LYERLY; KREGER, 1983; KAMATA et al., 1985; MOLLA et al., 1987), mice (CARLSON, 1983; LYERLY; KREGER, 1983; GONZÁLEZ-JUARBE et al., 2015), cats (PEDERSEN et al., 1998) and dogs (KUNSTYR; POSPISIL, 1962; MIYATA et al., 1980; OGILVIE et al., 1992).

In addition to these, there are also studies that point to natural infection and disease caused by the genus *Serratia* in other species, namely: birds (MÜLLER et al., 1986; POETA et al., 2016; KASHASH et al., 2022), cats (HOHENHAUS et al., 1997; KELLY et al., 2015; GUYONNET et al., 2019), dogs (FRANKE; RICHERT, 1944; WILKINS, 1973; PLAVEC et al., 2008; PEREZ et al., 2011; COALL et al., 2022; FRANCHINI et al., 2022), cattle (BARNUM et al., 1958; NICHOLLS et al., 1981; ISAKSSON; HOLMBERG, 1984; BOWMAN et al., 1986; WILSON et al. 1990; TODHUNTER et al., 1991; RUEGG et al., 1992; KAMARUDIN et al., 1996; DI GUARDO et al., 1997; SCHUKKEN et al., 2012; FRIMAN et al., 2019), molluscs (MÜLLER et al., 1995), turtles (HALL et al., 2022) and other reptiles, amphibians and fish (CLAUSEN; DURAN-REYNALS, 1937).

These studies report different types of diseases, which affect various structures of organs and systems, among which we can mention: ocular and pulmonary involvement; mastitis, transfusion reaction, abscess involving muscles and adjacent skin, among others.

Although experimental studies involving the genus *Serratia* in rabbits exist (BECKERDITE-QUAGLIATA et al., 1975; SIMBERKOFF et al., 1976; POINAR et al., 1979; LYERLY et al., 1981;



KREGER et al., 1986; BUGNON et al., 1996; HUME et al., 1999; PERRUCCI et al., 2005; MAH et al., 2007; ROMANOWSKI et al., 2021), no reports of infection and non-induced disease were found in *Oryctolagus cuniculus*, this being the first case reporting natural infection affecting the eye in this species.

As for cases of the genus *Serratia* as a cause of endophthalmitis in animals, there is still not much information other than the report of a cat presenting with panuveitis, increased IOP and unsatisfactory treatment (GUYONNET et al., 2019), similar to what happened in this study.

The main clinical signs of bacterial endophthalmitis are conjunctival hyperemia (SOSUAN; LEUENBERGER, 2020; WANG et al., 2020; BALASOIU et al., 2022), corneal edema (RELHAN; FLYNN, 2018; BHIKOO et al., 2022; KUMAR et al., 2022), blepharodema (NIYADURUPOLA, 2018; NAKAI et al., 2019; KATOCH; DOGRA, 2020), conjunctival discharge (BAWANKAR et al., 2019; SINHA et al., 2021; AL-ABRI et al., 2022) and hypopyon (BRAZZANO et al., 2019; MAKUSHA et al., 2020; SASI et al., 2023), corroborating the signs presented by the patient described in this case.

The antibiogram provides an assertive treatment, as bacteria of the genus *Serratia* have intrinsic resistance (MAHLEN, 2011; MESSAOUDI et al., 2021; PICCIRILLI et al., 2022). In this report there was sensitivity to a drug from the fluoroquinolone group (CIOFU; TOLKER-NIELSEN, 2019; HARASSIM et al., 2021), Ciprofloxacin. However, it was decided to treat the patient with another fluoroquinolone, Gatifloxacin, which is specific for ocular bacterial infections and has proven activity against Gram-negative *enterobacteria* such as *Serratia* sp. (BISPO et al., 2008; GALVIS et al., 2019; MENDES et al., 2019; CASTILLO AVILA et al., 2020; SANTOS et al., 2021; SATOBA GARZÓN et al., 2021; ESPINOZA SÁNCHEZ, 2022; JULITZA, 2022).

5 FINAL CONSIDERATIONS

Bacterial endophthalmitis is a poorly described pathology in veterinary medicine, and *Serratia* sp. is an uncommon pathogen.

No studies were found describing natural infection by *Serratia* sp. in rabbits, and this is the first report in the literature of ocular infection in the species *Oryctolagus cuniculus*.

The clinical signs of this type of infection for this species were severe, the treatment proved unsatisfactory and enucleation becomes inevitable. Histopathological examination proved to be efficient as a definitive diagnostic method for the case presented.



REFERENCES

- AGRAWAL, S. Spectrum of signs, symptoms, and treatment in amphotericin B-resistant Trichosporon endophthalmitis: A series of ten cases of post-cataract surgery cluster endophthalmitis. **Indian Journal of Ophthalmology**, 70, n. 11, p. 4004-4009, 2022. 10.4103/ijo.IJO_1938_22
- AL-ABRI, M.; AL-HINAI, A.; AL-ABRI, A.; LOBO, R. M. Acute postoperative infectious endophthalmitis caused by Gram-negative organisms. **Oman J Ophthalmol**, 15, n. 2, p. 204-207, May-Aug 2022. 10.4103/ojo.ojo_334_21
- BALASOIU, A. T.; ZLATIAN, O. M.; GHENEA, A. E. *et al.* A Rare Case of Endophthalmitis with Rhizobium radiobacter, Soon after a Resolved Keratitis: Case Report. **Antibiotics**, 11, n. 7, p. 905, 2022. <https://www.mdpi.com/2079-6382/11/7/905>
- BALOUIRI, M.; SADIKI, M.; IBNSOUDA, S. K. Methods for in vitro evaluating antimicrobial activity: A review. **Journal of Pharmaceutical Analysis**, 6, n. 2, p. 71-79, 2016/04/01 2016. <https://doi.org/10.1016/j.jpha.2015.11.005>
- BARBOSA, I. A. F.; WANZELER, A. C. V.; GOMES, H. A. P.; LÚCIO, K. C. d. V.; JORGE, E. C.; SCHELLINI, S. A. Endoftalmite fúngica endógena bilateral secundária a pielonefrite obstrutiva. 76, n. 1, p. 33-36, 2017. 10.5935/0034-7280.20170007
- BARNUM, D. A.; THACKERAY, E. L.; FISH, N. A. An Outbreak Of Mastitis Caused By Serratia Marcescens. **Can J Comp Med Vet Sci**, 22, n. 11, p. 392-395, Nov 1958. <https://pubmed.ncbi.nlm.nih.gov/17649094/>
- BASTOS, B. C.; DE OLIVEIRA SOARES, D.; SILVA, J. O. *et al.* Semiologia oftálmica veterinária: Revisão. **PUBVET**, 16, n. 4, p. 1-18, 2022-04-15 2021. DOI: <https://doi.org/10.31533/pubvet.v16n04a1082.1-18>
- BAWANKAR, P.; BHATTACHARJEE, H.; BARMAN, M. *et al.* Outbreak of Multidrug-resistant Pseudomonas Aeruginosa Endophthalmitis Due to Contaminated Trypan Blue Solution. **J Ophthalmic Vis Res**, 14, n. 3, p. 257-266, Jul-Sep 2019. 10.18502/jovr.v14i3.4781
- BECKERDITE-QUAGLIATA, S.; SIMBERKOFF, M.; ELSBACH, P. Effects of human and rabbit serum on viability, permeability, and envelope lipids of Serratia marcescens. **Infection and Immunity**, 11, n. 4, p. 758-766, 1975. doi:10.1128/iai.11.4.758-766.1975
- BELL, S. M.; SMITH, D. D. The CDS Disc Method of Antibiotic Sensitivity Testing (Calibrated Dichotomous Sensitivity Test). **Pathology**, 7, p. 1-48, 1975. 10.3109/00313027509082602
- BHIKOO, R.; BLAKISTON, M.; CUNNINGHAM, W.; MCCARTHY, S.; CHARLTON, A.; DONALDSON, M. Serratia Marcescens Endophthalmitis and Bacteraemia following Complicated Cataract Surgery. **Ocular Immunology and Inflammation**, 30, n. 4, p. 1020-1021, 2022/05/19 2022. 10.1080/09273948.2020.1846060
- BIEDENBACH, D. J.; MOET, G. J.; JONES, R. N. Occurrence and antimicrobial resistance pattern comparisons among bloodstream infection isolates from the SENTRY Antimicrobial Surveillance Program (1997-2002). **Diagn Microbiol Infect Dis**, 50, n. 1, p. 59-69, Sep 2004. 10.1016/j.diagmicrobio.2004.05.003
- BISPO, P. J. M.; MELO, G. B. D.; D'AZEVEDO, P. A.; HÖFLING-LIMA, A. L.; YU, M. C. Z.; PIGNATARI, A. C. C. Endoftalmite bacterianas com culturas positivas: uma revisão de 6 anos.



Arquivos Brasileiros de Oftalmologia, 71, n. 5, p. 617-622, 2008. 10.1590/s0004-27492008000500002

BORGES, M. R. A.; FREITAS, K. F., BARBOSA, E. F. G., ANDERLINI, G. P. de O. e S. ; PIMENTEL, M. M. L. P., CRUZ, R. K. S., SILVA, R. R. F da, MATOS, R. A. T. ASPECTOS TERAPÊUTICOS DA CERATOCONJUNTIVITE SECA EM CÃES: REVISÃO DE LITERATURA. *In*: MELCHIOR, L. A. K. (Ed.). **ATUALIDADES EM MEDICINA TROPICAL NA AMÉRICA DO SUL: VETERINÁRIA**, 2021.v. DOI: 10.35170/ss.ed.9786586283594.08 cap. 8, p. 125-144.

BOWMAN, G. L.; HUESTON, W. D.; BONER, G. J.; HURLEY, J. J.; ANDREAS, J. E. Serratia liquefaciens mastitis in a dairy herd. **J Am Vet Med Assoc**, 189, n. 8, p. 913-915, Oct 15 1986. <https://pubmed.ncbi.nlm.nih.gov/3771362/>

BREAZZANO, M. P.; JONNA, G.; NATHAN, N. R.; NICKOLS, H. H.; AGARWAL, A. Endogenous Serratia marcescens panophthalmitis: A case series. **American Journal of Ophthalmology Case Reports**, 16, p. 100531, 2019/12/01/ 2019. <https://doi.org/10.1016/j.ajoc.2019.100531>

BUGNON, D.; POTEL, G.; XIONG, Y. Q. *et al.* In vivo antibacterial effects of simulated human serum profiles of once-daily versus thrice-daily dosing of amikacin in a Serratia marcescens endocarditis experimental model. **Antimicrobial Agents and Chemotherapy**, 40, n. 5, p. 1164-1169, 1996. doi:10.1128/AAC.40.5.1164

CAIADO, A. V. P. R.; MORATO, R. M.; SILVA, C. d. M. N.; KOBAL, C. R.; DINIZ, B. Endoftalmite fúngica bilateral endógena. 79, n. 4, p. 266-269, 2020. 10.5935/0034-7280.20200057

CARLSON, E. Enhancement by Candida albicans of Staphylococcus aureus, Serratia marcescens, and Streptococcus faecalis in the establishment of infection in mice. **Infection and Immunity**, 39, n. 1, p. 193-197, 1983. doi:10.1128/iai.39.1.193-197.1983

CARVALHO, M. S.; DE SOUSA, T. F.; TAVARES, M. L.; SANTOS, J. V. S.; GRACIOLLI, G. Endoftalmite fúngica: relato de caso. **Revista de Patologia do Tocantins**, 8, n. 3, p. 38-41, 2021. 10.20873/uft.2446-6492.2021v8n3p38

CASTILLO AVILA, J. F.; UNIVERSIDAD DE LA SALLE, B.; AMAYA BOLIVAR, N. A.; UNIVERSIDAD DE LA SALLE, B. **Determinación de la susceptibilidad antimicrobiana contra cepas bacterianas causantes de endometritis clínica bovina**. 2020. Disponível em: https://ciencia.lasalle.edu.co/cgi/viewcontent.cgi?article=1964&context=medicina_veterinaria https://ciencia.lasalle.edu.co/medicina_veterinaria/964.

CASTRO-SAINES, E.; PEÑA-CHORA, G.; HALLAL-CALLEROS, C.; LAGUNES-QUINTANILLA, R.; FLORES-PEREZ, I.; HERNANDEZ-ORTIZ, R. Histometric and morphological damage caused by Serratia marcescens to the tick Rhipicephalus microplus (Acari: Ixodidae). **Archives of Microbiology**, 204, n. 11, p. 677, 2022/10/25 2022. 10.1007/s00203-022-03275-0

CHIN, K. W.; MICHELLE TIONG, H. L.; LUANG-IN, V.; MA, N. L. An overview of antibiotic and antibiotic resistance. **Environmental Advances**, 11, p. 100331, 2023/04/01 2023. <https://doi.org/10.1016/j.envadv.2022.100331>



CIOFU, O.; TOLKER-NIELSEN, T. Tolerance and Resistance of *Pseudomonas aeruginosa* Biofilms to Antimicrobial Agents—How *P. aeruginosa* Can Escape Antibiotics. **Frontiers in Microbiology**, 10, 2019-May-03 2019. Review. 10.3389/fmicb.2019.00913

CIULLA, T. A.; HARRIS, A.; CHUNG, H. S. *et al.* Color Doppler imaging discloses reduced ocular blood flow velocities in nonexudative age-related macular degeneration. **American Journal of Ophthalmology**, 128, n. 1, p. 75-80, 1999/07/01/ 1999. 10.1016/S0002-9394(99)00061-6

CLAUSEN, H. J.; DURAN-REYNALS, F. Studies on the Experimental Infection of Some Reptiles, Amphibia and Fish with *Serratia Anolium*. **Am J Pathol**, 13, n. 3, p. 441-452.441, May 1937. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1911115/?page=1>

COALL, S. M.; GROTH, A. D.; WHITE, J.; CROWE, Y. C.; BILLSON, F. M.; PREMONT, J. E. Prospective evaluation of the prevalence of conjunctival and intraocular bacteria in dogs undergoing phacoemulsification following a standardized aseptic preparation with 0.5% povidone iodine. **Veterinary Ophthalmology**, 25, n. 6, p. 434-446, 2022. <https://doi.org/10.1111/vop.13023>

COELHO, L. M.; SOUZA, T. M. D.; TANURE, M. A. G. Endophthalmitis prevalence in an university hospital. **Revista Brasileira de Oftalmologia**, 74, n. 3, 2015. 10.5935/0034-7280.20150030

DI GUARDO, G.; BATTISTI, A.; AGRIMI, U.; FORLETTA, R.; REITANO, M. E.; CALDERINI, P. Pathology of *Serratia marcescens* mastitis in cattle. **Zentralbl Veterinarmed B**, 44, n. 9, p. 537-546, Nov 1997. 10.1111/j.1439-0450.1997.tb01005.x

DIAS, F. G. G.; JORGE, A. T.; CINTRA, C. A. *et al.* Schirmer tear test, a useful diagnosis tool for the clinician. **Brazilian Journal of Development**, 6, n. 6, p. 40354-40363, 2020. 10.34117/bjdv6n6-538

DÍAZ BARRÓN, A.; HERVÁS HERNANDIS, J. M.; SANZ GALLEN, L.; LÓPEZ MONTERO, A.; GIL HERNÁNDEZ, I.; DUCH-SAMPER, A. M. Endoftalmitis de inicio tardío asociada a ampolla de filtración por *Moraxella nonliquefaciens*. **Archivos de la Sociedad Española de Oftalmología**, 95, n. 11, p. 559-564, 2020/11/01 2020. <https://doi.org/10.1016/j.oftal.2020.05.012>

DURAND, M. L. Bacterial and Fungal Endophthalmitis. **Clinical Microbiology Reviews**, 30, n. 3, p. 597-613, 2017. 10.1128/CMR.00113-16

ESPINOZA SÁNCHEZ, R. **Revisión bibliográfica del perfil microbiológico y perfil de sensibilidad antibiótica drevisión bibliográfica del perfil microbiológico y perfil de sensibilidad antibiótica de los pacientes con diagnóstico de úlcera corneal bacteriana, según lo documentado en la literatura en el periodo 2017-2022.** 2022. 65 f. (Especialista en Oftalmología) - Programa de Estudios de Posgrado de Especialidades Médicas. Disponible em: <https://www.kerwa.ucr.ac.cr/handle/10669/85790?show=full>. Acesso em: 2023/03/10.

FOX, J. G.; BEAUCAGE, C. M.; FOLTA, C. A.; THORNTON, G. W. Nosocomial transmission of *Serratia marcescens* in a veterinary hospital due to contamination by benzalkonium chloride. **Journal of Clinical Microbiology**, 14, n. 2, p. 157-160, 1981. doi:10.1128/jcm.14.2.157-160.1981

FRANCHINI, D.; PACI, S.; CICCARELLI, S.; VALASTRO, C.; GRECO, G.; DI BELLO, A. Chondroblastic Osteosarcoma Associated with Previous Chronic Osteomyelitis Caused by *Serratia liquefaciens* in a German Shepherd Dog. **Veterinary Sciences**, 9, n. 3, p. 96, 2022. Disponible em: <https://www.mdpi.com/2306-7381/9/3/96>



FRANKE, F.; RICHERT, D. SERRATIA MARCESCENS (BACILLUS PRODIGIOSUS) ON THE. **Journal of the National Cancer Institute: JNCI**, 5, p. 179, 1944. Disponível em: <https://books.google.com.br/books?hl=pt-BR&lr=&id=bB4xseQyBUQC&oi=fnd&pg=PA179&dq=serratia+in+dog&ots=AMeE3lbEpv&sig=LetWH6J-BUCncVdh4acTLWEDUU#v=onepage&q=serratia%20in%20dog&f=false>

FRIMAN, M. J.; EKLUND, M. H.; PITKÄLÄ, A. H.; RAJALA-SCHULTZ, P. J.; RANTALA, M. H. J. Description of two *Serratia marcescens* associated mastitis outbreaks in Finnish dairy farms and a review of literature. **Acta Vet Scand**, 61, n. 1, p. 54, Nov 14 2019. DOI: 10.1186/s13028-019-0488-7

GALERA, P. D.; ARAÚJO, R. L.; DE SANT'ANA, F. J.; CASTRO, M. B. Caracterização clínica e histopatológica de bulbos oculares de cães e gatos (2005-2015). **Pesquisa Veterinária Brasileira**, 37, p. 1125-1132, 2017. Disponível em: http://www.pvb.com.br/portal/download_artigo/MjEzMnwyMDIzMDIxMDE3MDE0NQ==

GALVIS, V.; PARRA, M. M.; TELLO, A. *et al.* Antibiotic resistance profile in eye infections in a reference centre in Floridablanca, Colombia. **Archivos de la Sociedad Española de Oftalmología (English Edition)**, 94, n. 1, p. 4-11, 2019/01/01 2019. DOI: <https://doi.org/10.1016/j.oftale.2018.07.008>

GLOE, S.; ROTHERING, A.; KILAND, J. A.; MCLELLAN, G. J. Validation of the Icare® TONOVET plus rebound tonometer in normal rabbit eyes. **Experimental eye research**, 185, p. 107698, August, 2019 2019. DOI: <https://doi.org/10.1016/j.exer.2019.107698>

GONZÁLEZ-JUARBE, N.; MARES, C. A.; HINOJOSA, C. A. *et al.* Requirement for *Serratia marcescens* Cytolysin in a Murine Model of Hemorrhagic Pneumonia. **Infection and Immunity**, 83, n. 2, p. 614-624, 2015. doi:10.1128/IAI.01822-14

GRIMONT, P. A. D.; GRIMONT, F. The Genus *Serratia*. **Annual Review of Microbiology**, 32, n. 1, p. 221-248, 1978. DOI: 10.1146/annurev.mi.32.100178.001253

GUERRA, R. L. L.; FREITAS, B. d. P.; PARCERO, C. M. F. M.; MAIA JÚNIOR, O. d. O.; MARBACK, R. L. An outbreak of forty five cases of *Pseudomonas aeruginosa* acute endophthalmitis after phacoemulsification. **Arquivos Brasileiros de Oftalmologia**, 75, p. 344-347, 2012. DOI: 10.1590/S0004-27492012000500010

GUYONNET, A.; MÉNARD, M.; MONGELLAS, E.; LASSAIGNE, C.; BOULOUIS, H.-J.; CHAHORY, S. Supposed endogenous endophthalmitis caused by *Serratia marcescens* in a cat. **Open Veterinary Journal**, 9, n. 1, p. 13-17, 2019-01-23 2019. DOI: 10.4314/ovj.v9i1.3

HALL, J.; BENDER, H.; MILLER, N.; THOMPSON, P. Fatal Bronchopneumonia and Tracheitis in a Green Turtle (*Chelonia mydas*) Caused by *Serratia proteamaculans*. **Animals**, 12, n. 15, p. 1891, 2022. <https://doi.org/10.3390/ani12151891>

HARASSIM, L.; SILVA, O. L. F. d.; PINHEIRO, L. F. S.; SANTOS, E. J. A. d.; CERDEIRA, C. D.; BARROS, G. B. S. Risk factors and profile of antimicrobial use among patients with urinary tract infection at an intensive care unit. **Research, Society and Development**, 10, n. 3, p. e43910313516, 03/21 2021. DOI: 10.33448/rsd-v10i3.13516

HOFF, G. L. *Serratia*. In: HOFF, G. L.; FRYE, F. L., *et al* (Ed.). **Diseases of Amphibians and Reptiles**. Boston, MA: Springer US, 1984. v. 10.1007/978-1-4615-9391-1_5 p. 59-67. DOI: 10.1007/978-1-4615-9391-1_5



HOHENHAUS, A. E.; DRUSIN, L. M.; GARVEY, M. S. Serratia marcescens contamination of feline whole blood in a hospital blood bank. **Journal of the American Veterinary Medical Association**, 210, n. 6, p. 794-798, 1997/03// 1997. Disponível em: <http://europepmc.org/abstract/MED/9074682>

HUME, E. B. M.; CONERLY, L. L.; MOREAU, J. M. *et al.* Serratia marcescens keratitis: Strain-specific corneal pathogenesis in rabbits. **Current Eye Research**, 19, n. 6, p. 525-532, 1999/01/01 1999. DOI: 10.1076/ceyr.19.6.525.5283

ISAKSSON, A.; HOLMBERG, O. Serratia-mastitis in cows as a herd problem. **Nord Vet Med**, 36, n. 11, p. 354-360, Nov-Dec 1984. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/6397718/>

JACKSON, T. L.; PARASKEVOPOULOS, T.; GEORGALAS, I. Systematic review of 342 cases of endogenous bacterial endophthalmitis. **Surv Ophthalmol**, 59, n. 6, p. 627-635, Nov-Dec 2014. DOI: 10.1016/j.survophthal.2014.06.002

JACKSON, T. L.; PARASKEVOPOULOS, T.; GEORGALAS, I. Systematic review of 342 cases of endogenous bacterial endophthalmitis. **Survey of Ophthalmology**, 59, n. 6, p. 627-635, 2014/11/01/ 2014. DOI: 10.1016/j.survophthal.2014.06.002

JAIN, V.; DABIR, S.; SHOME, D.; DADU, T.; NATARAJAN, S. A Case Report with Review of Literature. **Survey of Ophthalmology**, 54, n. 2, p. 286-291, 2009. DOI: 10.1016/j.survophthal.2008.12.008

JULITZA, R. M. K. **Pertinencia Del Manejo De Antibióticos En El Área De Emergencia Del Hospital Básico Padre Alberto Buffoni**. 2022. Thesis v. Ecuador - PUCESE - Maestría en Salud Pública Mención Atención Integral en Urgencia y Emergencias Disponível em: <https://repositorio.pucese.edu.ec/handle/123456789/3130?mode=simple>.

KAMARUDIN, M. I.; FOX, L. K.; GASKINS, C. T.; GAY, J. M. Environmental reservoirs for Serratia marcescens intramammary infections in dairy cows. **J Am Vet Med Assoc**, 208, n. 4, p. 555-558, Feb 15 1996. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/8603907/>

KAMATA, R.; YAMAMOTO, T.; MATSUMOTO, K.; MAEDA, H. A serratial protease causes vascular permeability reaction by activation of the Hageman factor-dependent pathway in guinea pigs. **Infection and Immunity**, 48, n. 3, p. 747-753, 1985. doi: 10.1128/iai.48.3.747-753.1985

KASHASH, R. R.; KAREEM, I. Q. A.; AL-KHATIB, B. G. GENETIC ANALYSIS AND ANTIBIOTIC SUSCEPTIBILITY OF SERRATIA FONTICOLA ISOLATED FROM ORNAMENTAL BIRDS IN IRAQ. **BIOCHEMICAL AND CELLULAR ARCHIVES**, 22, n. 2, p. 4035-4042, 2022. doi: <https://doi.org/10.51470/bca.2022.22.2.4035>

KATOCH, D.; DOGRA, M. R. Postoperative Endophthalmitis. In: CHAKRABARTI, M. e CHAKRABARTI, A. (Ed.). **Posterior Segment Complications of Cataract Surgery**. Singapore: Springer Singapore, 2020.v. 10.1007/978-981-15-1019-9_7 p. 81-94. doi: 10.1007/978-981-15-1019-9_7

KECK, N.; DUNIE-MERIGOT, A.; DAZAS, M. *et al.* Long-lasting nosocomial persistence of chlorhexidine-resistant Serratia marcescens in a veterinary hospital. **Veterinary Microbiology**, 245, p. 108686, 2020/06/01/ 2020. doi: <https://doi.org/10.1016/j.vetmic.2020.108686>



KELLY, E. J.; BALDWIN, T. J.; CHAMBERLAIN, A. P. Pathology in Practice. **Journal of the American Veterinary Medical Association**, 247, n. 8, p. 897-899, 2015. doi: 10.2460/javma.247.8.897

KREGER, A. S.; LYERLY, D. M.; HAZLETT, L. D.; BERK, R. S. Immunization against experimental *Pseudomonas aeruginosa* and *Serratia marcescens* keratitis. Vaccination with lipopolysaccharide endotoxins and proteases. **Investigative Ophthalmology & Visual Science**, 27, n. 6, p. 932-939, 1986. Disponível em: <https://iovs.arvojournals.org/article.aspx?articleid=2159894>

KUMAR, A.; KHURANA, A.; SHARMA, M. A case of double hypopyon secondary to *Serratia* keratitis after penetrating keratoplasty. **Indian Journal of Ophthalmology - Case Reports**, 2, n. 1, p. 39-40, January 1, 2022. Case Report. doi: 10.4103/ijo.IJO_1924_21

KUNSTYR, I.; POSPISIL, J. PENETRATION OF SERRATIA MARCESCENS FROM THE INTESTINE INTO THE ORGANISM OF IRRADIATED DOGS. **Folia Microbiologica (Prague) (Czechoslovakia) Formerly Cesk. Mikrobiol.**, Vol: 7, p. Medium: X; Size: Pages: 83-87, 1962. doi: 10.1007/bf02926336

LEAL, S. M.; RODINO, K. G.; FOWLER, W. C.; GILLIGAN, P. H. Practical Guidance for Clinical Microbiology Laboratories: Diagnosis of Ocular Infections. **Clinical Microbiology Reviews**, 34, n. 3, p. doi: e00070-00019, 2021. doi:10.1128/CMR.00070-19

LEBER, A. L. **Clinical microbiology procedures handbook**. John Wiley & Sons, 2020. ISBN 1555818811.

LYERLY, D.; GRAY, L.; KREGER, A. Characterization of rabbit corneal damage produced by *Serratia* keratitis and by a *serratia* protease. **Infection and Immunity**, 33, n. 3, p. 927-932, 1981. doi:10.1128/iai.33.3.927-932.1981

LYERLY, D. M.; KREGER, A. S. Importance of *serratia* protease in the pathogenesis of experimental *Serratia marcescens* pneumonia. **Infection and Immunity**, 40, n. 1, p. 113-119, 1983. doi:10.1128/iai.40.1.113-119.1983

MAH, F. S.; ROMANOWSKI, E. G.; KOWALSKI, R. P.; YATES, K. A.; GORDON, Y. J. Zymar (Gatifloxacin 0.3%) Shows Excellent Gram-Negative Activity Against *Serratia marcescens* and *Pseudomonas aeruginosa* in a New Zealand White Rabbit Keratitis Model. **Cornea**, 26, n. 5, p. 585-588, 2007. doi:10.1097/ICO.0b013e318033a6f2

MAHLEN, S. D. *Serratia* Infections: from Military Experiments to Current Practice. **Clinical Microbiology Reviews**, 24, n. 4, p. 755-791, 2011. doi:10.1128/CMR.00017-11

MAKUSHA, L. P.; YOUNG, C. R.; AGARWAL, D. R.; PUCAR, D. Bilateral End-Organ Endophthalmitis in Setting of *Serratia marcescens* Urosepsis on 18F-FDG PET/CT. **Clinical Nuclear Medicine**, 45, n. 3, p. e141-e143, 2020. doi:10.1097/rlu.0000000000002883

MATSUSHITA, K.; UCHIYAMA, J.; KATO, S.-i. *et al.* Morphological and genetic analysis of three bacteriophages of *Serratia marcescens* isolated from environmental water. **FEMS Microbiology Letters**, 291, n. 2, p. 201-208, 2009. doi:10.1111/j.1574-6968.2008.01455.x

MENDES, J.; TROMBETTA, L.; AMARAL, A. RETINOPATIA ASSOCIADA AO USO DE ENROFLOXACINO EM GATOS. **ENCICLOPEDIA BIOSFERA**, 16, n. 29, p. 1347-1364, 2019/06/30 2019. DOI: 10.18677/EnciBio_2019A121



MEREDITH, T. A.; AGUILAR, H. E.; MILLER, M. J.; GARDNER, S. K.; TRABELSI, A.; WILSON, L. A. Comparative treatment of experimental *Staphylococcus epidermidis* endophthalmitis. **Archives of Ophthalmology**, 108, n. 6, p. 857-860, 1990. doi:10.1001/archopht.1990.01070080101043

MESSAOUDI, A.; MANSOUR, W.; TILOUCHE, L. *et al.* First report of carbapenemase OXA-181-producing *Serratia marcescens*. **Journal of Global Antimicrobial Resistance**, 26, p. 205-206, 2021/09/01/ 2021. doi:https://doi.org/10.1016/j.jgar.2021.06.004

MIYATA, K.; HIRAI, S.; YASHIKI, T.; TOMODA, K. Intestinal absorption of *Serratia* protease. **J. Appl. Biochem.; (United States)**, 2:2, p. Medium: X; Size: Pages: 111-116 2009-2012-2016, 1980. Disponível em: <https://www.osti.gov/biblio/5126428>

MOLLA, A.; MATSUMURA, Y.; YAMAMOTO, T.; OKAMURA, R.; MAEDA, H. Pathogenic capacity of proteases from *Serratia marcescens* and *Pseudomonas aeruginosa* and their suppression by chicken egg white ovomacroglobulin. **Infection and Immunity**, 55, n. 10, p. 2509-2517, 1987. doi:10.1128/iai.55.10.2509-2517.1987

MÜLLER, H. E.; FANNING, G. R.; BRENNER, D. J. Isolation of *Serratia fonticola* from Mollusks. **Systematic and Applied Microbiology**, 18, n. 2, p. 279-284, 1995/01/01 1995. doi: [https://doi.org/10.1016/S0723-2020\(11\)80399-1](https://doi.org/10.1016/S0723-2020(11)80399-1)

MÜLLER, H. E.; STEIGERWALT, A. G.; BRENNER, D. J. Isolation of *serratia fonticola* from birds. **Zentralblatt für Bakteriologie, Mikrobiologie und Hygiene. Series A: Medical Microbiology, Infectious Diseases, Virology, Parasitology**, 261, n. 2, p. 212-218, 1986/04/01/ 1986. doi: [https://doi.org/10.1016/S0176-6724\(86\)80038-4](https://doi.org/10.1016/S0176-6724(86)80038-4)

NAKAI, T.; KIMURA, M.; YOSHIYAMA, K.; MATONO, T. Endogenous endophthalmitis caused by *Streptococcus agalactiae*: An ophthalmologic emergency. **IDCases**, 15, p. e00499, 2019/01/01/ 2019. doi: <https://doi.org/10.1016/j.idcr.2019.e00499>

NARENDRA KUMAR, H. K.; CHANDRA MOHANA, N.; RAKSHITH, D.; ABHILASH, M. R.; SATISH, S. Multicomponent assessment and optimization of the cellulase activity by *Serratia marcescens* inhabiting decomposed leaf litter soil. **Sustainable Chemistry and Pharmacy**, 31, p. 100951, 2023/04/01/ 2023. doi: <https://doi.org/10.1016/j.scp.2022.100951>

NASCIMENTO, F. F. P., ZULIM, J. V. G. C., SILVA, L. F. da C., GIUFFRIDA, D. A., ESTANHO, R. VILLA, G. J. C., ANDRADE, M. C., FRANCO, S. Comparação entre o teste de meniscometria de tira e outros testes oftálmicos em cães com olhos normais e com ceratoconjuntivite seca. **ARQUIVOS BRASILEIROS DE OFTALMOLOGIA**, 82, p. 1-8, 2021/10/20 2019. DOI: 10.5935/0004-2749.20230057

NES, T. Endophthalmitis. **Ophthalmologe**, 115, n. 8, p. 697-706, Aug 2018. doi: 10.1007/s00347-018-0729-6

NEVES, R. A.; RIGUEIRO, M. P.; BORDON, A. F.; BURNIER JUNIOR, M. Endoftalmite micótica endógena: aspectos clínicos e histopatológicos de 3 casos. **Arquivos Brasileiros de Oftalmologia**, 53, n. 1, 1990. doi: 10.5935/0004-2749.19900047

NICHOLLS, T. J.; BARTON, M. G.; ANDERSON, B. P. *Serratia liquefaciens* as a cause of mastitis in dairy cows. **Vet Rec**, 109, n. 13, p. 288, Sep 26 1981. doi: 10.1136/vr.109.13.288



NIYADURUPOLA, N. Emergency management: acute endophthalmitis. **Community Eye Health**, 31, n. 103, p. 68-69, 2018. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6253312/>

OGILVIE, G. K.; ELMSLIE, R. E.; CECCHINI, M.; WALTERS, L. M.; PEARSON, F. C. Use of a biological extract of *Serratia marcescens* to decrease doxorubicin-induced myelosuppression in dogs. **American journal of veterinary research**, 53, n. 10, p. 1787-1790, 1992/10// 1992. Disponível em: <http://europepmc.org/abstract/MED/1280926>

PAGANINI, L. K.; PEREIRA, S. M.; PRETO, A. D. L.; CAMINOTTO, E. D. L. C. AVALIAÇÃO IN VITRO DA CAPACIDADE DE ABSORÇÃO DOS TESTES DE SCHIRMER E PONTA DE PAPEL ABSORVENTE ENDODÔNTICA, UTILIZADOS EM EXAMES OFTALMOLÓGICOS DE ANIMAIS DE PEQUENO PORTE. **Anais da Mostra Nacional de Iniciação Científica e Tecnológica Interdisciplinar (MICTI)-e-ISSN 2316-7165**, 1, n. 14, 2021.

PEDERSEN, N. C.; DEAN, G. A.; BERNALES, J.; SUKURA, A.; HIGGINS, J. *Listeria monocytogenes* and *Serratia marcescens* infections as models for Th1/Th2 immunity in laboratory cats. **Veterinary Immunology and Immunopathology**, 63, n. 1, p. 83-103, 1998/05/15/ 1998. doi: [https://doi.org/10.1016/S0165-2427\(98\)00085-3](https://doi.org/10.1016/S0165-2427(98)00085-3)

PEREZ, C.; FUJII, Y.; FAULS, M.; HUMMEL, J.; BREITSCHWERDT, E. Fatal Aortic Endocarditis Associated with Community-Acquired *Serratia marcescens* Infection in a Dog. **Journal of the American Animal Hospital Association**, 47, n. 2, p. 133-137, 2011. doi: 10.5326/jaaha-ms-5616

PERRUCCI, S.; ROSSI, G.; FICHI, G.; O'BRIEN, D. J. Relationship between *Psoroptes cuniculi* and the Internal Bacterium *Serratia marcescens*. **Experimental & Applied Acarology**, 36, n. 3, p. 199-206, 2005/07/01 2005. doi: 10.1007/s10493-005-4511-5

PICCIRILLI, A.; CHERUBINI, S.; BRISDELLI, F. *et al.* Molecular Characterization by Whole-Genome Sequencing of Clinical and Environmental *Serratia marcescens* Strains Isolated during an Outbreak in a Neonatal Intensive Care Unit (NICU). **Diagnostics**, 12, n. 9, p. 2180, 2022. doi: <https://doi.org/10.3390/diagnostics12092180>

PINTO, B. C. M.; SIMÕES, F. A.; MOREIRA, G. F. *et al.* Corticoterapia: manifestações oculares adversas. **Revista Eletrônica Acervo Saúde**, 12, n. 11, p. e4785-e4785, 2020. doi: 10.25248/reas.e4785.2020

PLAVEC, T.; ZDOVC, I.; JUNTES, P. *et al.* Necrotizing fasciitis caused by *Serratia marcescens* after tooth extraction in a Doberman Pinscher: a case report. **Veterinarni Medicina**, 53, n. 11, p. 629-635, 2008.

POETA, P.; SARGO, R. F.; VALENTE, J. M. *et al.* *Serratia marcescens* Discospondylitis in a White Stork (*Ciconia ciconia*). **SOJ Microbiology & Infectious Diseases**, 4, n. 3, p. 1-5, 2016. Disponível em: <https://pdfs.semanticscholar.org/f1c7/c189b9c38ac16f90c865dd1778fae3b4dbb0.pdf>

POINAR, G. O.; WASSINK, H. J.; LEEGWATER-VAN DER LINDEN, M. E.; VAN DER GEEST, L. P. *Serratia marcescens* as a pathogen of tsetse flies. **Acta tropica**, 36, n. 3, p. 223-227, 1979/09// 1979. Disponível em: <http://europepmc.org/abstract/MED/43085>

POOLE, S.; CLARK, T. W. Rapid syndromic molecular testing in pneumonia: the current landscape and future potential. **Journal of Infection**, 80, n. 1, p. 1-7, 2020. doi: <https://doi.org/10.1016/j.jinf.2019.11.021>



- PRADEL, E.; ZHANG, Y.; PUJOL, N.; MATSUYAMA, T.; BARGMANN, C. I.; EWBANK, J. J. Detection and avoidance of a natural product from the pathogenic bacterium *Serratia marcescens* by *Caenorhabditis elegans*. **Proceedings of the National Academy of Sciences**, 104, n. 7, p. 2295-2300, 2007. doi:10.1073/pnas.0610281104
- PUJARI, A.; BHASKARAN, K.; MODABOYINA, S. *et al.* Cysticercosis in ophthalmology. **Survey of Ophthalmology**, 67, n. 2, p. 544-569, 2022. doi: 10.1016/j.survophthal.2021.07.002
- RELHAN, N.; FLYNN, H. W. Endophthalmitis Caused by Gram-Negative Bacteria. In: DAS, T. (Ed.). **Endophthalmitis : A Guide to Diagnosis and Management**. Singapore: Springer Singapore, 2018.v. 10.1007/978-981-10-5260-6_17 p. 185-198. doi: 10.1007/978-981-10-5260-6_17
- ROMANOWSKI, E. G.; STELLA, N. A.; ROMANOWSKI, J. E. *et al.* The Rcs Stress Response System Regulator GumB Modulates *Serratia marcescens*-Induced Inflammation and Bacterial Proliferation in a Rabbit Keratitis Model and Cytotoxicity In Vitro. **Infection and Immunity**, 89, n. 8, p. e00111-00121, 2021. doi:10.1128/IAI.00111-21
- RUEGG, P. L.; GUTERBOCK, W. M.; HOLMBERG, C. A.; GAY, J. M.; WEAVER, L. D.; WALTON, R. W. Microbiologic investigation of an epizootic of mastitis caused by *Serratia marcescens* in a dairy herd. **J Am Vet Med Assoc**, 200, n. 2, p. 184-189, Jan 15 1992.
- SADER, H. S.; FARRELL, D. J.; FLAMM, R. K.; JONES, R. N. Antimicrobial susceptibility of Gram-negative organisms isolated from patients hospitalised with pneumonia in US and European hospitals: results from the SENTRY Antimicrobial Surveillance Program, 2009-2012. **Int J Antimicrob Agents**, 43, n. 4, p. 328-334, Apr 2014. doi: 10.1016/j.ijantimicag.2014.01.007
- SANTOS, M. d. F.; MARIOTTO, I. d. F.; MASSITEL, I. L. *et al.* Use of fluoroquinolones in domestic dogs and cats. **Research, Society and Development**, 10, n. 9, p. e25110917858, 07/25/2021 2021. doi: 10.33448/rsd-v10i9.17858
- SARALEGUI, C.; PONCE-ALONSO, M.; PÉREZ-VISO, B. *et al.* Genomics of *Serratia marcescens* Isolates Causing Outbreaks in the Same Pediatric Unit 47 Years Apart: Position in an Updated Phylogeny of the Species. **Frontiers in Microbiology**, 11, 2020-March-31 2020. Original Research. doi: 10.3389/fmicb.2020.00451
- SASI, S.; FARAJ, H.; BARAZI, R. *et al.* Endogenous endophthalmitis due to *Serratia marcescens* secondary to late-onset empyema Post-Cardiac surgery in an End-Stage renal disease patient on peritoneal dialysis. **Clinical Case Reports**, 11, n. 2, p. e6997, 2023. doi: <https://doi.org/10.1002/ccr3.6997>
- SATOBA GARZÓN, C. A.; UNIVERSIDAD DE LA SALLE, B.; VELASCO RAMÍREZ, C. D.; UNIVERSIDAD DE LA SALLE, B. **Antibióticos más utilizados por Optómetras en Colombia para el tratamiento de infecciones bacterianas de la superficie ocular**. 2021. Disponível em: <https://ciencia.lasalle.edu.co/cgi/viewcontent.cgi?article=2887&context=optometria>
- SCHIRMBECK, T.; ROMÃO, E.; RODRIGUES, M. d. L. V.; FIGUEIREDO, J. F. d. C. Endoftalmite: uma análise de 58 casos. **Arquivos Brasileiros de Oftalmologia**, 63, p. 39-44, 2000. doi: 10.1590/S0004-27492000000100008
- SCHUKKEN, Y.; CHUFF, M.; MORONI, P. *et al.* The “Other” Gram-Negative Bacteria in Mastitis. **Veterinary Clinics: Food Animal Practice**, 28, n. 2, p. 239-256, 2012. doi: 10.1016/j.cvfa.2012.04.001



- SEVILLANO, C.; SÁNCHEZ RODRÍGUEZ, B.; RODRÍGUEZ LÓPEZ, V. Oftalmología domiciliar: una necesidad creciente. **Archivos de la Sociedad Española de Oftalmología**, 95, n. 12, p. 575-578, 2020/12/01/ 2020. doi: <https://doi.org/10.1016/j.ofal.2020.06.006>
- SIMBERKOFF, M. S.; MOLDOVER, N. H.; RAHAL, J. J., Jr. Specific and Nonspecific Immunity to *Serratia marcescens* Infection. **The Journal of Infectious Diseases**, 134, n. 4, p. 348-353, 1976. doi: [10.1093/infdis/134.4.348](https://doi.org/10.1093/infdis/134.4.348)
- SINGH, R.; DAVOUDI, S.; NESS, S. Preventive factors, diagnosis, and management of injection-related endophthalmitis: a literature review. **Graefes Arch Clin Exp Ophthalmol**, 260, n. 8, p. 2399-2416, Aug 2022. doi: [10.1007/s00417-022-05607-8](https://doi.org/10.1007/s00417-022-05607-8)
- SINHA, P.; SINHA, U.; RAJ, A.; PATI, B. K. Bilateral endogenous endophthalmitis complicated by scleral perforation: an unusual presentation. **BMJ Case Reports**, 14, n. 9, p. e244547, 2021. doi: [10.1136/bcr-2021-244547](https://doi.org/10.1136/bcr-2021-244547)
- SOENENS, A.; IMPERIAL, J. Biocontrol capabilities of the genus *Serratia*. **Phytochemistry Reviews**, 19, n. 3, p. 577-587, 2020/06/01 2020. doi: [10.1007/s11101-019-09657-5](https://doi.org/10.1007/s11101-019-09657-5)
- SOSUAN, G. M. N.; LEUENBERGER, E. U. Late-onset Subconjunctival Abscess Secondary to *Serratia marcescens* Associated With Unexposed Ahmed Glaucoma Valve Implant. **Journal of Glaucoma**, 29, n. 10, p. e110-e112, 2020. doi: [10.1097/ijg.0000000000001617](https://doi.org/10.1097/ijg.0000000000001617)
- STUART, M. D. T. **MEIO DE TRANSPORTE STUART**. Bula, 2020. Disponível em: <https://www.laborclin.com.br/wp-content/uploads/2020/10/511261-MEIO-DE-TRANSPORTE-STUART-TB-35ml-CX50TB-1.pdf>.
- TANAKA, K.; SHIMADA, H.; MORI, R.; NAKASHIZUKA, H.; HATTORI, T.; OKUBO, Y. No increase in incidence of post-intravitreal injection endophthalmitis without topical antibiotics: a prospective study. **Japanese Journal of Ophthalmology**, 63, n. 5, p. 396-401, Sep 2019. doi: [10.1007/s10384-019-00684-5](https://doi.org/10.1007/s10384-019-00684-5)
- TANAKA, T. **Diagnóstico etiológico das endoftalmites e análise direta do humor vítreo em frasco de hemocultura por espectrometria de massas MALDI-TOF**. 2019. Tese de Doutorado v. <https://doi.org/10.11606/T.5.2019.tde-23082019-161421>-, Universidade de Sao Paulo, Agencia USP de Gestao da Informacao Academica (AGUIA) Disponível em: <https://dx.doi.org/10.11606/t.5.2019.tde-23082019-161421>. doi: <https://doi.org/10.11606/T.5.2019.tde-23082019-161421>
- TANAKA, T.; FONSECA, F. L. D.; HELAL JUNIOR, J. Necrose retiniana aguda por presumível etiologia viral por herpes simples resultando em endoftalmite: relato de caso. **Revista Brasileira de Oftalmologia**, 70, n. 1, p. 41-45, 2011. doi: [10.1590/s0034-72802011000100009](https://doi.org/10.1590/s0034-72802011000100009)
- TIECCO, G.; LAURENDA, D.; MULÈ, A. *et al.* Gram-Negative Endogenous Endophthalmitis: A Systematic Review. **Microorganisms**, 11, n. 1, Dec 28 2022. doi: [10.3390/microorganisms11010080](https://doi.org/10.3390/microorganisms11010080)
- TODHUNTER, D. A.; SMITH, K. L.; HOGAN, J. S. *Serratia* species isolated from bovine intramammary infections. **J Dairy Sci**, 74, n. 6, p. 1860-1865, Jun 1991. doi: [10.3168/jds.S0022-0302\(91\)78351-3](https://doi.org/10.3168/jds.S0022-0302(91)78351-3)
- TRAD, S.; SAADOUN, D.; ERRERA, M. H. *et al.* Ocular tuberculosis. **Rev Med Interne**, 39, n. 9, p. 755-764, Sep 2018. doi: [10.1016/j.revmed.2018.05.003](https://doi.org/10.1016/j.revmed.2018.05.003)



WALTERS, L.; D CHECCHIO, L.; F HASSAN, S.; ROSENZWEIG, J.; TZARNAS, S. SERRATIA MARCESCENS CAVITARY PNEUMONIA FOLLOWING COVID-19 INFECTION IN A YOUNG IMMUNOCOMPETENT HOST. **CHEST**, 162, n. 4, p. A390, 2022. doi: 10.1016/j.chest.2022.08.300

WANG, Y.; WANG, X.; DI, Y. Surgery combined with antibiotics for the treatment of endogenous endophthalmitis caused by liver abscess. **BMC Infectious Diseases**, 20, n. 1, p. 661, 2020/09/07 2020. doi: 10.1186/s12879-020-05390-z

WILKINS, R. J. Serratia marcescens septicaemia in the dog. **Journal of Small Animal Practice**, 14, n. 4, p. 205-215, 1973. doi: <https://doi.org/10.1111/j.1748-5827.1973.tb06918.x>

WILSON, D. J.; KIRK, J. H.; WALKER, R. D.; BOSWORTH, Q. W. Serratia marcescens mastitis in a dairy herd. **J Am Vet Med Assoc**, 196, n. 7, p. 1102-1105, Apr 1 1990. Disponível em: <https://pubmed.ncbi.nlm.nih.gov/2184155/>

WINARTI, T.; PRAYOGO, M. E.; PAWIRORANU, S.; LUTHFIAMIDA, R.; SANCOYO, G. Intravitreal moxifloxacin in acute post-phacoemulsification endophthalmitis: a case report. **Malaysian Journal of Ophthalmology**, 3, n. 4, p. 236-243, 2021. doi: 10.35119/myjo.v3i4.225

XIE, C. A.; SINGH, J.; TYAGI, M. *et al.* Endogenous Endophthalmitis - A Major Review. **Ocular Immunology and Inflammation**, v. 10.1080/09273948.2022.2126863p. 1-24, 2022. doi: 10.1080/09273948.2022.2126863