

Manuscript title: The effects of Cannabis sativa on aggressive behaviour towards humans in shelter dogs.

Corsetti, S.^{1*}, Borruso, S.², Malandrucchio, L.³, Spallucci, V.⁴, Maragliano, L.³, Perino, R.³, D'Agostino, P.⁵ & Natoli, E.³.

¹School of Agriculture and Environment, University of Western Australia, 6060 Crawley, WA.

²Canine consultant, freelance, Rome, Italy.

³Sovrazonal Dog Shelter, Local Health Unit Rome 3, Rome, Italy.

⁴Istituto Zooprofilattico Sperimentale del Lazio e della Toscana M. Aleandri, Rome, Italy.

⁵Public Dog Shelter Muratella e Pontemarconi, Roma Capitale, Rome, Italy

*Corresponding author: sar.corsetti@gmail.com

Supplementary Information

Ethogram utilised during the sessions of behavioural observation (Corsetti et al. 2018).

Activity:

Standing: staying in an upright position, on four legs.

Walking: walking in the fenced area within the shelter.

Trotting: trotting in the fenced area within the shelter.

Galloping: galloping in the fenced area within the shelter.

In/out: going in and out of the indoor/outdoor zone of the cage.

Aggressive behaviour:

Growling: threatening vocalisation coming from the throat.

Sideways glance: looking transversely with the head upright or bent. The glance is threatening.

Raising fur: raising the fur of the head, body and tail so that the dog appears to have a larger size and is thus more threatening.

Curling lip: light raising of the upper lip, usually only on one side, with a threatening partial display of the teeth.

Showing teeth: curling of the upper and lower lips while opening the mouth with a threatening display of the teeth, particularly the canine teeth.

Dashing at bars: dashing at bars in the direction of the observer, of another person or of another dog.

Displacing activities:

Body shaking: shaking the body quickly sideward.

Scratching: raising one hind leg and vigorously scratching part of the body.

Muzzle licking: passing the tongue over the muzzle.

Auto-grooming: cleaning itself with the tongue and the teeth.

Stereotyped or repetitive behaviour:

Repetitive pacing in circles: repetitive walking in a circle within the cage.

Licking or biting compulsively: repeatedly licking or biting the bars, the wall and objects.

Catching flies: trying to catch an imaginary fly with the mouth, clutching at empty air with the teeth.

Coprophagy.

Self-mutilation: licking itself continuously in same part of the body, so intensely to cause abrasions or even wounds.

Attention:

Raising ears

Looking outside: looking outside the cage.

Looking out carefully: looking outside the cage very carefully; the position resembles that described for "prompt" but the dog is not ready to spring up.

Looking at observer: looking at the observer.

Looking at unknown people: looking at people the dog does not know.

Looking at volunteer: looking at a shelter volunteer worker.

Looking at dog: looking at another dog.

Raising foreleg: raising one foreleg.

Raising forelegs on wall: raising both forelegs onto the wall or onto the bars, looking carefully outside

Olfactory investigation:

Sniffing environment: putting the muzzle on the ground, on the wall, or on the objects in the cage, the dog sniffs the environment.

Sniffing air: raising the head, moving the nostrils and breathing the air to perceive odours.

Sniffing observer: pointing the muzzle towards the observer, the dog moves the nostrils clearly trying to perceive the odours of the observer.

Sniffing unknown people: pointing the muzzle towards people the dog does not know, the dog moves the nostrils clearly trying to perceive their odours.

Sniffing volunteer: pointing the muzzle towards volunteers working in the shelter, the dog moves the nostrils clearly trying to perceive their odours.

Sniffing dog: pointing the muzzle towards another dog, the subject moves the nostrils clearly trying to perceive the object's odours.

Dominant behaviour:

Staring: gazing at the observer, another person or another dog right in the eyes.^[L]_[SEP]^[L]_[SEP]

Stiff body and tail still: standing still in an upright posture, with the ears raised and turned forward, the four legs straight and rigid and the tail immobile and rigid at a medium height.

Raised tail: the tail is held high while it is still.^[L]_[SEP]

Wagging with the tail held high: moving the tail sideward while held high.^[L]_[SEP]

Pricked-up ears: holding the ears forwards while assuming an upright body posture with head and tail held high, legs straight and stiff.^[L]_[SEP]

Paw or a muzzle on a conspecific's back: putting the muzzle or one forepaw or both over the back of another dog.

Submissive behaviour:

Avoiding eye contact: looking away from the observer, another human or another dog, who is looking at the subject.^[L]_[SEP]

Lowering head: lowering the head in front of the observer, another human or another dog.

Ears down: putting the ears down, pressed on the head, or holding them backwards.^[L]_[SEP]

Cringing: lying with the ventral region in contact with the ground.^[L]_[SEP]

Tail between the legs: holding the tail down or tightly between the hind legs and against the belly.

Lying down on back: laying down on the back exposing the ventral side of the chest and sometimes the abdomen.^[L]_[SEP]

Vocal communicability:^[L]_[SEP]

Barking: emitting an abrupt, loud, noisy, and often repetitive vocalisation characteristic of dogs.

Mumbling: emitting a vocalisation that consists of a sort of inside murmur.^[L]_[SEP]

Whining: emitting a mournful vocalisation.^[L]_[SEP]

Grumbling: emitting a low and deep vocalisation that seems to come from the chest, the dog generally has the mouth closed.^[L]_[SEP]

Howling: emitting a vocalisation that consists of a long, high and mournful sound; characteristic of wolves, quite rare in dogs.^[L]_[SEP]

Snorting: emitting a vocalisation while puffing out its cheek and emitting air.^[L]_[SEP]

Affiliative behaviour:^[L]_[SEP]

Wagging tail: the tail is wagged sideward but not held high, in a relaxed manner.^[L]_[SEP]

Giving the foreleg: raising one of the forelegs and leaning it in the direction of the observer.

Leaning on bars: leaning the body in direct contact with the bars of the cage.^[L]_[SEP]

Licking the mouth: licking the muzzle of other dogs.^[L]_[SEP]

Passive contact: staying in contact with some part of the body, without sleeping.^[L]_[SEP]

Allo-grooming: cleaning the fur of another dog, licking and nibbling.^[L]_[SEP]

Resting:

Sitting: sitting down with the rump leaning on the ground.^[L]_[SEP]

Lying: lying down on the ground.^[L]_[SEP]

Dozing: curling up, the dog is half asleep.

Playing:

Inviting to play: inviting another dog or human to play: the dog bends down with the forelegs outstretched on the ground and the rump upwards, or brings an object, runs around and jumps.

Answering invitation to play: playing with another dog after having been invited to do so.
