



## Review Article

# Bestiality: A Crossing Point for the Emergence and Renaissance of Zoonosis

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## ABSTRACT

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**Background:** Due to the legal implications and taboo nature of the subject, there remains a lack of knowledge surrounding paraphilia and bestiality. Many people interact with animals in their daily lives, either indoors or away from home. Close contact with animals, particularly in psychologically disturbed individuals, may lead to extreme feelings, which may lead to sexual contact between humans and animals. Sexual abuse of animals has been known since ancient times. **Aim:** the current systematic review presented the possible role of technology to promote sexual addiction, particularly among children, the role of porn film imageries to normalize animal-human sex, the hidden danger of paraphilia to threatens human health, and an excerpt history of the originality of sexually transmitted zoonotic pathogens. We also inquired about the potential of zoonotic diseases to spread, their vertical transmission, and how normal productivity in humans can be affected. The role of symbiosis in sexually transmitted diseases was also presented. **Methods:** Google Scholar, PubMed, and Egyptian Knowledge Bank were searched using the keywords paraphilia, zoophilia, bestiality, and zoonotic disease. **Conclusions:** Bestiality remains obscured. Normalization of bestiality and the subsequent spread of sexual zoonosis is a figure of bioweapon. The hidden role of the internet to spread bestiality should be regarded.

**Keywords:** sexual perversion; paraphilia; medicolegal; sexual abuse; normalization

## I. INTRODUCTION:

Programs of bioweapons have been developed since the Cold War. Initially, these biowarfare programs employed pathogens that naturally exist and are capable of infecting animals and crops. In World War I, pathogenic anthrax bacteria were posted by Germans targeting

united states (U.S.) politicians. Later, this bioagent was genetically modified by the Soviet Union to produce a more resistant strain that is hard to diagnose and treat. With the nonstop improvement of biotechnology, the bat virus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was

developed into a man-made chimeric virus that typically infects selective species and continually mutates. Eventually, this history reveals how chimeric bioagents are the bioweapons of the future (Michalski et al., 2022).

Building on this context, currently, the reason beyond the increasing number of zoonotic diseases in recent times should be inquisitive. Where did the severe zoonotic epidemics come from? Zoonosis is regarded as the leading source of emerging infectious diseases globally and is accountable for overwhelming epidemics, death, and grave socioeconomic drawbacks (Maritz et al., 2014). It is noteworthy that over 200 zoonotic diseases possess virulence that can debilitate human host fitness, leading to observed poor outcomes.

Was the primary human infection through active contact between human beings and animals? In 2020, Wang et al determined the direct physical contact between humans and animals as a crossing point for bestiality. More warranty is the ability of these pathogens to host the mucosal lining of human body organs involving the genital system and thus their presence in sexual secretions. Similarly, paraphilia has been reported as a pivotal means of transmission in several reported cases of zoonotic diseases. This may raise the question of an alarming issue, which is the probability of manipulating psychological troubles present

in some individuals to spread bestiality among humans. However, less frequent studies have been conducted on this critical topic.

Paraphilia is now becoming observable in 'modern' cultures, 'urban' milieus, and among men. In this regard, the Internet has had an ultimate influence by connecting and recruiting individuals who share acceptance of these rehearses definite ways of sexuality (Bártová et al.,2021). Importantly, this effect played by the internet affords the sensation of normalization of abnormal sexual habits coincident with several claims that encourage paraphilia in recent times. Ethnographic records demonstrated that this deviant process almost starts during childhood and teenage years, and synchronously, these sexual practices are interconnected with the idea of masculinity and exploration of sexuality. Does humanity return to a dark time in history where the 17th and 18th centuries witnessed the spread of abnormal sexual relations with animals in collective practice in some countries, such as Sweden (Liliequist, 1991; Rydström, 2003)?. In the same context, in 2022, Stefanska et al highlighted the relationship between the consumption of pornography and the normalization of the atypical forms of sexualities and habits (Stefanska et al.,2022).

"Bestiality" refers to sexual interactions between humans and animals in which the human does not emotionally attach to the

animal (Aggrawal, 2011). However, rather than being malicious, animal sexual abuse (ASA) may have a clinical component in which a person is unable to control their sexual urge. When there are emotional and sexual feelings for an animal, the word "zoophilia" is employed (Aggrawal, 2011). There are self-identified zoophile groups that, even knowing their activities may be unlawful, prefer to have sexual relations with animals over humans (Williams & Weinberg, 2003; Miletski, 2017; Sendler, 2019). Maintaining voluntariness in human sexual encounters is crucial from a legal, ethical, and social standpoint; nevertheless, sexual willingness is not a feeling that an animal can express to a human (Holoyda et al., 2018). Although some argue that an animal's non-retaliatory behavior and agreement constitutes consent, coercion is always present (Beetz, 2005; Levy, 2003). Because the animal does not choose to participate in the activity voluntarily, informed consent cannot be granted, and the encounter entails the danger of extreme suffering, injury, or even death (Beirne, 1997). Thus, animals subjected to sexual relationships with humans are at risk of suffering, and this form of interaction should not be prohibited by legislation (Hvozdič et al., 2006). ASA is banned in the vast majority of countries and should be investigated criminally and forensically (Natha, 2020).



**Figure 1.** Forensic necropsy examination algorithm of an animal suspected or known to be sexually abused (Stern & Smith-Blackmore, 2016).

In Figure (1), the algorithm summarizes the processing of suspected ASA cases. Internal and external examinations, as well as adequate and extensive documentation and evidence collecting, are all part of the forensic necropsy. A complete history should be provided to the pathologist before performing the forensic necropsy, including the circumstances of the event, type of sexual contact suspected, use of weapons/objects and/or restraints, description of medical intervention, and information regarding the animal, including recent urination, defecation, and feces (Gerdin & McDonough, 2013). If available, evaluate scene images and narrative reports from the submitting law enforcement agency.

The forensic necropsy data should be documented so that it may be examined or recreated by others and fulfill the criteria required for legal procedures. A body diagram form used to record the locations of injuries (such as contusions and abrasions) and places

that fluoresce during an alternate light source (ALS) examination may be included in the documentation (Stern & Smith-Blackmore, 2016).

Evidence collection and handling are key aspects of forensic examination. The evidence mustn't be destroyed inadvertently during the examination, it is properly documented, it is stored in a way that facilitates inspection by other laboratories, and it is declared admissible in a court of law. Whether or not there are substantially apparent lesions or identifiable evidence, the examination technique and evidence collecting should be consistent, because negative findings could be used to exonerate an alleged suspect. The pathologist's responsibility is to the court, thus the examination of the animal and collecting of evidence must be neutral, unbiased, and open to various alternatives, rather than prejudiced toward one side or the other. The aim and purpose of the forensic necropsy examination is to answer the question of what occurred to the animal, not who did it (Stern & Smith-Blackmore, 2016). Biological evidence deposited at the crime scene or on the victim during criminal activities, such as body fluids, not only aids in crime reconstruction, but also gives a means of identifying the fluid donor. Molecular forensic techniques are commonly employed for body fluid identification (BFI) and subsequent human identification and are thus an essential component of forensic

investigations. Semen confirms a sexual act, and by identifying human semen on or in animals, an incidence of ASA can be adequately substantiated. These discrepancies underscore the need to select the proper fur model to best depict the animal of interest; for example, dissected fur from a recently killed animal would best imitate a fatal ASA case. The knowledge gained from the animal model selection could be useful for future studies, which should focus on the effect of more realistic variables (e.g., mobility and body heat) on sperm and DNA retention in animal fur (Natha, 2020).

## **II. METHODOLOGY:**

Three online databases were searched using keywords to find articles: Google Scholar, PubMed, and Egyptian Knowledge Bank (EKB). Peer-reviewed studies that provided definitions between 1990 and 2023 were involved as references. Yet, previous articles that satisfied the requirements were added. Reviews and studies that did not support the established protocol were excluded.

## **III. Bestiality:**

In the 5<sup>th</sup> edition of the Diagnostic and Statistical Manual (DSM-5), it is classified as paraphilia as “any intense and persistent sexual interest other than sexual interest in genital stimulation or preparatory fondling with phenotypically normal, physically

mature, consenting human partners” (American Psychiatric Association, 2013). The DSM-5 discriminates a paraphilic disorder from just paraphilia. A paraphilic disorder is a malady that causes impairment or misery to the subject or a paraphilia that causes personal harm or exposure to the risk as a consequence of its satisfaction. Forensic samples are confined to specific subgroups, and the prevalence of bestiality in a general population is not known. Remarkably, these kinds of relations between humans and animals may occur in combination, and the two terms cannot be considered distinct categories (Beetz, 2004; Miletski, 2005).

This paraphilic disorder involving animals can be frequently sexual contact in the individual’s residence place or on a farm or stable, which provides the subjects with some degree of secrecy, decreasing the risk of being discovered. Dogs and horses are the most commonly encountered animals in bestiality (Beetz,2004). The reconsideration of the American Psychiatric Association (2013) now permitted an individual to involve an animal in atypical sexual behavior without considering the matter as a mental disorder (American Psychiatric Association, 2013). However, the real prevalence of these abnormalities in a general population is still obscure and thus believed to be rare (Holoyda et al., 2020). Similarly, definite kinds of fitness to bestiality are present in individuals who are inquisitive, adventurous, and termed

to be “open” to peculiar experiences and implausible ideas. However, dispositional openness may also pave the road to an increased risk of disease transmission (Ojonoma, 2008).

Bestiality is a crime in several states and countries, and in some United States is considered animal abuse and a crime against nature (Beetz, 2004; Turcios, 2014). In modern society, bestiality is considered an offensive theme, yet the informed incidence rates range between 8.3% and 4.9% in men and from 3.6% to 1.9% for women in the general population (Sangeeta, 2017).

Sexual activity with animals by minors under the age of sixteen is considered with some indulgence by the Kisii people of Kenya (LeVine, 1959). It is accepted that boys are exercising their sexual prowess. After this age, however, the same behaviors are condemned and penalized. According to John Money (Money, 2012), young males frequently learned how to be sexually ready for marriage by engaging in sexual activity with donkeys among the pre-Columbian peoples that lived along Colombia's Caribbean coast. This is not just a historical custom; it is still practiced today on Colombia's Caribbean coast to the point where the locals are referred to as "donkey eaters" (literally, "donkey eats," meaning they engage in sexual relations with donkeys) in Colombia (Delgado, 1987). Young people begin to have their first sexual encounters

with female donkeys as early as age seven or eight. Even paying for sexual encounters with these creatures is possible (Valcuende del Río & Cáceres-Feria, 2020). These identical techniques have also been prevalent elsewhere in Central America. In a community in northern Costa Rica, close to the Nicaraguan border, numerous males were questioned in 2004. They recalled how young boys commonly began their sexual lives with animals. Men talked about it among themselves; it was a secret they kept from women. From the 1980s onward, when outsiders who viewed these acts as repugnant first entered local communities, this style of sexuality began to be hidden. Male masturbation and intercourse with different animal species, including female donkeys, female calves, hens, turkeys, and nanny goats, have been documented incidents of adolescent youths engaging in group sexual encounters in Mexico (Núñez Noriega, 2016). In Honduras, the same is present (Barriga et al., 2006). Some Amazonian indigenous groups have documented human-animal sexual interactions. Erikson, (2017) claims that adult males among the Matis people of the Brazilian Amazon go outside into the jungle to satiate them sexually with sloths, a species they commonly domesticate. This is not a unique instance, as this author points out, "Zoophilic practices are no less frequent in the Amazon forests than in the countryside of Europe". He names a few authors who

provide information in this regard, including Edeb among the Aché people of Paraguay and Morey and Metzger among the Guahibo people of the Orinoco Plains (Morey & Metzger, 1974). The Brazilian Karitiana people have also been observed engaging in sexual activities with female canines (Vander Velden & Companhia, 2010). In Crete and Cyprus, French anthropologist Marie-Christine Anest showed that the Mediterranean is also no exception (Anest, 1985).

These same actions, however, were derided and disapproved by adults. Except for a work by Coca et al. that details a few occurrences in rural populations of western Andalusia, there is essentially no research on bestiality in Spain (Coca-Pérez et al., 2019). The authors contend that learning about sexuality in boys and teenagers is related to human-animal sexual interactions. This article focuses on some similarities between the types of bestiality identified in research from the Mediterranean and Latin America. Before having sex with a woman or a man, adolescents may occasionally engage in sexual activity with animals, almost as a rite of passage. The study also emphasizes the "secrecy" of these activities, which are well known within the friendship group but kept secret from those outside the group, particularly from women. Boys play at "being animals" and "being men," interact with animals, and interact with one another. The

creation of masculinity is entwined with sexual behavior with other animals. A derogatory model is created in opposition to "others", including women, inferior males, boys, and animals (Gilmore, 1990; Kimmel, 1997). Because what is deemed abnormal in one cultural context may be more acceptable in another, diagnosing bestiality across cultures or religions can be challenging.

***Let us ask whether technology can be used as a tool to promote sexual addiction, especially among children:***

Technologies and social webs are chiefly present in public people's lives. Not every parent thinks about revealing pornography when their children are left online alone. A recent study used Fisher Vectors, the most recent version of the Bags of Visual Words (BoVW) model, to combine local information collected by Temporal Robust Features (TRoF) software into a mid-level representation. They used a novel approach, comparing it to BoVW solutions based on additional space-temporal variables from scholarly literature as well as commercial pornography detection methods. The Pornography-2k dataset, a new difficult pornographic benchmark that includes 2000 web videos and 140 hours of video material, is used to evaluate the performance. The dataset, which is also a contribution to this work, is quite diversified, including both professional and amateur videos, and it shows many types of pornographic content,

including live-action and cartoons, with a variety of behaviors and ethnicities. When compared to the best commercial classifier, the best method, which is based on a dense application of TRoF, produces a classification error reduction of approximately 79%. A sparse description using the TRoF detector is especially significant since it can be used to address real-time information needs and results in a classification error reduction of over 69% while using 19 less Random Access Memory (RAM) than the dense solution (Wiles et al., 2011, Moreira et al. 2016).

***Do porn film imageries pave the way for animal-human sex?***

A study demonstrated several serious outcomes for deviant pornography. Out of 630 respondents to the Survey Sampling International panel, fifty-four consumed animal pornography, thirty-three reported child pornography, and the remaining 254 respondents stated that they used nondeviant adult pornography. Consumers of child pornography were found to use both adult and animal pornography. Another point is the age of onset for using deviant pornography, which follows a Guttman-like progression. The earlier age of initiation for using adult pornography is more likely to be involved in the deviant forms of pornography (bestiality or child) if compared with a later age of beginning (Seigfried-Spellar and Rogers, 2013).

Another point is the introduction of sex interspecies under the umbrella of the democratization of information. Grebowicz, (2010) claimed that pornography producers manipulate dogs and horses, with human females having similar muscularity to human males. Moreover, to intensely encourage their online spread, “gay” zoo porn is increasingly produced where men do sex with male animals per anal and introduce many different kinds of animals. However, the existence of these critical online images will undoubtedly naturalize the deviant behavior of bestiality later in time.

***In this context, to what extent does the propagation of this abnormal sexual behavior threaten human health as a mysterious “bioweapon”? do we have a full history of the originality of sexually transmitted zoonotic pathogens?***

Sexual contact of humans with animals may result in zoonotic illnesses via bacteria, viruses, or parasites through saliva, vaginal secretions, seminal fluids, and oral-fecal contact (Allard, 2020). Sexually transmitted diseases (STDs) in humans and animals have a long history. "Two or three of the major STDs have come from animals," says Alonso Aguirre, a veterinarian and vice president for conservation medicine at Wildlife Trust. "For instance, gonorrhoea in humans is known to have originated in cattle. Moreover, syphilis may have been transmitted sexually many years ago from cattle or sheep to humans."

Additionally, parasitic diseases can transmit smoothly due to the availability of multiple hosts for every single parasite (Thornhill et al., 2010). Herein, in this section, we exhibit examples of zoonotic agents with venereal potential in animals that have emerged in humans.

***Chlamydia.*** *Chlamydiaceae* are obligate intracellular bacteria. *Chlamydia suis* and *C. trachomatis* are sexual zoonotic pathogens that principally exist in pigs (Dean et al.,2013; Käser et al.,2017). The prevalence of *C. suis* in pig semen has already been reported and is considered a potential route of infection among pigs. *C. suis* and *C. trachomatis* were shown to persist in the vagina of pigs from 3 to 21 days, and intrauterine infection remained for twenty-one days (Käser et al.,2017). In humans, in 2018, a study revealed that Chlamydia is a very common venereal disease in the United States (Kreisel et al.,2021). *C. suis* has recently been isolated from the conjunctivae of patients with trachoma in Nepal (Dean et al.,2013).

***Leptospira.*** This genus of bacteria belongs to the family Leptospiraceae and is recognized to be an emerging zoonosis worldwide. Rats are the main reservoir host, while domestic animals, e.g., cattle, dogs, and pigs, are temporary carriers. It is also reinstated as a “Nationally Notifiable Condition” (Guerra, 2013). Infections in humans are chiefly related to exposure to fresh water contaminated with the urine of animals

infected with bacteria or direct contact with animal body secretions (Picardeau, 2013). Sangeeta determined that any direct contact with the sexual organs of reservoir hosts can transmit this disease to humans (Sangeeta, 2017). Arora and Kumar, (2020) demonstrated that disgusting human-animal sexual conduct can lead to the transmission of leptospirosis in humans. Meningitis due to leptospirosis can result in death in up to ten percent of patients (Sangeeta, 2017). Holoyda et al. (2018) discussed leptospirosis as one of the fatal zoonotic infections that may be transmitted to patients who suffer psychological troubles and practice bestiality.

***Kurthia gibsonii***. Opportunistic bacteria are known to cause hepatitis, peritonitis, salpingitis, and oophoritis in poultry (Lozica et al.,2022). Another incidence was reported by Ongrádi et al. (2014), who documented the presence of bacteria in specimens collected from the urethra and glans in a patient who suffered from urethritis and balanitis and gave a history of frequent penetrative unprotected sexual intercourse with his female piglets. This showed that *K. gibsonii* can accustom to mucous membranes in the human genital tract and survive. In 2016, a similar scenario was reported by Kövesdi et al in a patient who practiced bestiality with pigs.

**Monkeys and Simian immunodeficiency virus (SIV)**. There is one sickness that is even more terrifying, but it has evolved and mutated from its original form in

chimpanzees and gorillas from west central Africa. Human immunodeficiency virus (HIV), which almost always results in a painful and distressing death if untreated and allowed to progress to acquired immunodeficiency syndrome (AIDS), was first discovered in humans in the 20th century. Simian immunodeficiency virus (SIV) is thought to have been widespread in African monkey populations for more than 30,000 years (Takehisa et al., 2009). Humanity witnessed the AIDS pandemic (by HIV-1 group-M) in one incidence and sporadic infection in only a few Cameroonian patients (from HIV-1 group-N) in another. A 3<sup>rd</sup> HIV-1 lineage (group -O) drop within the territory of SIV was reported in west central Africa (D'arc et al.,2015) that originated from wild gorillas. In 2006, bestiality was reported within the sexual behavior patterns of patients suffering venereal diseases involving HIV (Van Heuverswyn et al.,2006).

***Leishmania infantum***. It is an intracellular flagellate parasite that was found to be chiefly present in dogs. It is a causative agent of zoonotic visceral leishmaniasis characterized by fever and enlargement of the liver and spleen. Despite being transmitted primarily by the sandfly, sexual transmission can propagate infection as well due to the wide dissemination of the amastigotes in the internal organs, genital tract, semen, and saliva (Quinnell & Courtenay, 2009). *Leishmania chagasi*, another agent of visceral

leishmaniasis prevalent chiefly in dogs in the Americas, was reported to have a tropism to the genital system, predominantly the epididymis, prepuce, and glans penis, with shedding of the parasite in the semen. In humans, a case reporting the venereal spread of visceral leishmaniasis (VL) between a man and his female partner was conveyed in the United Kingdom, where VL and the vector are absent (Symmers,1960). In addition, *Leishmania* was detected in prostatic fluids and urine and can be transmitted during the rectal sex in homosexual men (Singh, 2002).

***Toxoplasma gondii***. It is a sporozoan parasite with earlier origin in the Amazon, where felids are the principal hosts. Using polymerase chain reaction (PCR) and bioassays, *T. gondii* was detected in the semen of infected sheep and goats with potential sexual transmission of the parasite (Lopes et al.,2013; Santana et al.,2013). Recently, in humans, it has been supposed that *T. gondii* could be transmitted sexually from infected men to their uninfected female partners. Moreover, the parasite could be transmitted via fellatio (oral sex) from infected men to their uninfected partner (female or male), particularly if the uninfected partner swallowed the infected semen fluid (Kaňková et al.,2020). The most serious is congenital toxoplasmosis, which results from the transmission of *T. gondii* from an acutely infected mother to her fetus.

***Giardia species (spp.)***. Since earlier times, *Giardia spp.*, an intestinal flagellate, has been regarded as a zoo-anthropologic with considerable prevalence in domestic animals involving sheep (17.7%), cattle (10.4%), lambs (35.6%), and calves (27.7%). The transmission of intestinal pathogens due to anal sex is attributed to three factors: the endemicity of these pathogens, the pattern of sexual behaviors, and the rate of sexual contact with the infected partner (Phillips et al., 1981). Interestingly, immunoblotting of serum revealed the prevalence of human *Giardia* in sheep and those species that primarily infect ovine in human serum (Buret et al., 1990). *Giardia spp.* is transmitted through abnormal sexual habits via the feco-anal-oral route (Escobedo et al., 2014, Escobedo et al., 2018). *Giardia spp.* has become convenient in the United States to categorize STDs by the Centers for Disease Control and Prevention (CDC) (Haggerty & Ericson,2006).

▪ **Sexually zoonotic pathogens and the potentiality to spread:**

The progression of emergent zoonotic pathogens is dependent on several factors, as shown in the following models.

For example, regarding giardiasis as an STD, it is worth mentioning that the zoonotic transmission of this parasite is genotype- and subtype dependent. Of the eight recognized genetic subtypes (A-H), A and B are of

zoonotic potential and can infect humans and animals (Gorcea et al.,2020).

**The virulence factors** that promote the dynamics of these infections (Cascio et al.,2011). Trichomonads provide an exclusive model to adapt for zoonosis by the multiplicity of virulence factors exceeding the 60,000 coded proteins (Carlton et al.,2007). This serves several functions involving phagocytosis, cytoadherence, cytopathogenesis (Figueroa-Angulo et al.,2012; Hirt et al.,2011), and great competence to parasitize a diversity of host cells and mucosal sites (Wu et al., 2003). *Tetratrichomonas gallinarum*, *Tritrichomonas fetus*, *Histomonas meleagridis*, and *Trichomonas gallinae* have been demonstrated to be the causative agents of venereal diseases in livestock (Frey and Müller, 2012). Fetus represents a novel form of transmission from the gut to the urogenital system where the parasite shows the capability to parasitize in several species (e.g., pigs, cats, and dogs). Hence, trichomonads have been demonstrated as emerging infectious zoonoses (Huang et al.,2013).

**The pathological spectrum of a zoonotic pathogen paves the road for the pathology of other diseases.**

Several examples can be shown at this point; for instance, there is evidence for the zoonotic transmission of HIV-2 during the first half of the twentieth century. From 1963–1974, an HIV epidemic started in Guinea-Bissau

corresponding to the independence war, proposing war-related alterations in sociocultural concepts (Lemey et al.,2003). Thereafter, homosexual men with HIV infection showed higher susceptibility to parasitic infections. For example, *Cryptosporidium parvum* can cause severe disease even with a low dose of oocysts due to the immunocompromised status of these patients (Pedersen et al.,1996), a condition that increases in patients who have close contact with animals or practice abnormal sexual habits (Hellard et al.,2003; Pumipuntu & Piratae, 2018). Interestingly, reconstituting the immune system in HIV patients through Highly active antiretroviral therapy (HAART) reduces the oocyst shedding of the parasite (Bachur et al.,2008). Moreover, HIV infections showed an increased association pattern for *Isospora belli* (Cardoso et al.,2014), *Cryptosporidium* spp., and *Strongyloides stercoralis* (Singh, 2002; Bachur et al.,2008; Cimerman et al.,1999). Trichomonads, which are microaerophilic organisms and are unlikely to initiate disease, were found to exhibit a case of opportunity among AIDS patients. This genus involves *Pentatrichomonas hominins*, *Trichomonas tenax*, *T. vaginalis*, *T. fetus*, and *T. gallinarum* in the respiratory tract of humans, causing pulmonary trichomoniasis (Maritz et al.,2014; Schmerin et al.,1978).

Coinfection of *T. vaginalis* with *Mycoplasma* sp. and bacterial vaginosis has been reported

in several studies. Additionally, infection with *T. vaginalis* increases the threat of HIV infections (McClelland et al., 2007).

In another parasitic model, Bachur et al. (2008) and Cimerman et al. (1999) demonstrated the prevalence of *Ascaris lumbricoides*, *Ancylostoma duodenale*, *Hymenolepis nana*, and *Trichuris trichiura* in association with acquired immunodeficiency syndrome through risky sexual behaviors. However, this point still needs much research.

▪ **Sexually zoonotic parasites can be vertically transmitted:**

In an Italian study, congenital transmission of Zoonotic Visceral Leishmaniasis (ZVL) was shown in puppies (Masucci et al., 2003); however, Brazilian studies denied this incidence (Andrade et al., 2002; Rosypal et al., 2005). The congenital transmission of ZVL in humans has been documented in several case reports despite the absence of symptoms in infected mothers (Meinecke et al., 1999; Pagliano et al., 2005).

*T. gondii* was shown to be sexually transmitted from men to women; hence, the risk of congenital toxoplasmosis increases (Hlaváčová et al., 2021). Earlier studies detected *Cryptosporidium* oocysts in the uterine tissues of ewes and pigs (Fleta et al., 1995) and experimentally induced intrauterine infection with the parasite grieve dissemination of the oocysts in the internal body organs was demonstrated (Kim et

al., 1988). However, this pattern of distribution in humans has not yet been evaluated.

▪ **Sexually transmitted zoonotic pathogens may affect productivity in humans:**

The zoonosis's negative effects are far-reaching. High incidence rates continue to cause significant morbidity and mortality in both humans and animals (Pal et al., 2020). It represents a major challenge for humanity, as it affects human productivity in various ways. How diseases affect productivity depends on the type of disease and the extent of the damage it causes. Reduced travel and tourism to impacted areas, decreased cattle and food production, animal deaths and destruction, and limits on and decreases in international trade are just a few examples of how they influence the economy. Zoonoses can significantly harm a nation's economy, which can hurt a society's health.

▪ **Role of symbiosis in sexually transmitted diseases:**

Endosymbiosis is the phenomenon through which one organism thrives within another, exerting evolution and reshaping the ecology of uncountable species (Wernegreen, 2012).

El Saftawy et al. (2021) proposed an inquiry regarding the symbiont relationship between sexually related parasites such as *C. parvum* and *G. lamblia* and COVID-19, as they appeared to harbor double-stranded ribonucleic acid (RNA) viruses. For example, *Cryptosporidium parvum* virus-1, one of the

*Partitiviridae*, genus *Cryspovirus* viruses, is an unencapsidated, sensitive, and double-stranded virus that shows a symbiotic relationship with *Cryptosporidium parvum* (*C. parvum*). Interestingly, a Japanese study showed that the virus has a geographically related pattern of distribution where the *C. parvum* - IIAA15G2R1 subtype belongs to Hokkaido and the southern part of Japan (Murakoshi et al., 2016). Additionally, therapeutic targeting of the virus can eliminate the intracellular oocysts of the parasite (Khrantsov et al., 1997; Mele et al., 2003).

In the same context, a prior study recognized the *Giardia virus*, which is a double stranded RNA (ds-RNA) virus that symbioses *Giardia* parasites (genotypes A and B) in a receptor-dependent pattern (Adam, 2021; Currie et al., 2017). However, this *Vilyaviridae* virus can infect *Giardia duodenalis* parasites as well as a wide range of hosts, e.g., plants, vertebrates, diatoms, and molds (Kinsella et al., 2020).

In addition, *Mycoplasma hominis* and *Trichomonas vaginalis* are symbionts (Fichorova et al., 2017) that show a harmonized mode of replication and metabolic pathway (Dessi et al., 2005; Margarita et al., 2020) and synchronous transmission triggering the pathogenicity of each other. Consequently, the stimulated production of cytokines and triggered inflammation (Fichorova et al., 2013) can

increase the risk of acquiring HIV infections (Dessi et al., 2019). In this context, we inquire whether sexually transmitted parasites can serve as bioweapons through their chimeric viral symbionts.

## VI. CONCLUSION &

### RECOMMENDATIONS:

In this review, we summarize our current understanding of the emergence of new pathogens as a potential bioweapon and the manipulation of the internet and social media to promote sexual addiction and normalize zoophilia and bestiality that will directly play a hidden and silent role in spreading pathogens among human communities in a continual pattern. In addition, we witnessed several documented examples of bestiality and inquired about the possible impact of symbionts and how sexually transmitted diseases may pave the way for other pathogens.

Animal sexual abuse, being a kind of sexual assault, as well as animal cruelty, must be taken seriously. ASA necessitates additional research as well as cross-reporting by law enforcement, social services, and medical and veterinary professionals when responding to suspected incidents of domestic and interpersonal violence, child endangerment, and animal cruelty. This reporting should be made easier by standardizing intake and evaluation methods that include questions about potential animal sex abuse. The

irregularity and heterogeneity in how bestiality laws are written, implemented, and judged show a need for more education of enforcement officials, prosecutors, judges, and legislators. The wide range of sexual assault patterns suggests that zoophilia and bestiality are more widespread and serious than previously thought. More research into the backgrounds and sexual motivations of animal sex offenders, as well as broader use of forensic evaluations, could aid in their detection, intervention, sentencing, and treatment protocols, as well as predicted risk of reoffending.

#### VII. Author Contribution

This work was a collaboration between all authors. The authors Enas A. El Saftawy, Ahmed Hamdy Badr, and Fatma Nada Khalifa designed and wrote the protocol of the current review, the authors Mostafa Elnakib and Ahmed Hamdy Badr wrote and revised the microbiological related content from literature, the authors Fatma Nada Khalifa and Asmaa Mohammad Moawaad wrote and revised the forensic content regarding literature, the author Enas A. El Saftawy wrote the parasitology related content, revised references, and was the corresponding author. All authors read, reviewed, and approved the final manuscript.

#### IX. Funding

The review was self-funded by the authors.

#### X. Declarations

Competing Interests: The authors declare no competing interests.

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### البهيمية: نقطة عبور لظهور ونهضة الأمراض الحيوانية المنشأ

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#### الملخص العربي

الخلفية: نظراً للأثار القانونية والطبيعية المحظورة للموضوع، لا يزال هناك نقص في المعرفة المحيطة بالشذوذ الجنسي والبهيمية. يتفاعل الكثير من الناس مع الحيوانات في حياتهم اليومية، سواء في الداخل أو بعيداً عن المنزل. قد يؤدي الاتصال الوثيق بالحيوانات، وخاصة لدى الأشخاص المضطربين نفسياً، إلى مشاعر متطرفة، مما قد يؤدي إلى الاتصال الجنسي بين الإنسان والحيوان. إن الاعتداء الجنسي على الحيوانات معروف منذ العصور القديمة.

الهدف: قدمت المراجعة المنهجية الحالية الدور المحتمل للتكنولوجيا في تعزيز الإدمان الجنسي، خاصة بين الأطفال، ودور صور الأفلام الإباحية في تطبيع الجنس بين الإنسان والحيوان، والخطر الخفي للبارافيليا الذي يهدد صحة الإنسان، ومقتطفات من تاريخ الإدمان الجنسي. أصالة مسببات الأمراض الحيوانية المنشأ المنقولة جنسياً. واستفسرنا أيضاً عن إمكانية انتشار الأمراض الحيوانية المنشأ، وانتقالها العمودي، وكيف يمكن أن تتأثر الإنتاجية الطبيعية لدى البشر. كما تم عرض دور التكافل في الأمراض المنقولة جنسياً.

طرق البحث: تم البحث في بابميد و جوجل سكولار وبنك المعرفة المصري باستخدام الكلمات الرئيسية: الشذوذ، الامراض الحيوانية المنشأ و البهيمية

الاستنتاجات: البهيمية لا تزال غامضة. إن تطبيع البهيمية وما تلا ذلك من انتشار للأمراض الجنسية الحيوانية المنشأ هو شكل من أشكال الأسلحة البيولوجية. وينبغي النظر في الدور الخفي للإنترنت في نشر البهيمية.